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Original Contributions.

A BLOT ON THE PROFESSION.

By Geo. H. Cushing, D. D. S., Chicago.

There is no operation that the dentist is called upon to perform which is of greater importance than the removal of calcareous deposits from the teeth, whether they be of salivary or serumal origin; and probably no necessary operation is so often entirely ignored, or when undertaken, is so many times imperfectly and slightingly performed. The evidence of this has been a matter of observation for many years by those who have given proper and earnest attention to the subject, and it is so constantly presenting itself that at this advanced period of dental practice it seems absolutely incomprehensible and, in view of the serious consequences which are sure to follow its neglect, almost monstrous.

These facts are testified to by members of the profession in all parts of the country, and the astonishment at such a state of affairs, so hard to believe, is universal. One gentleman relates that a few years ago a patient came to him suffering intense pain in his teeth and gums. An examination failed to reveal anything the matter with the teeth; there was no sign of decay and the teeth had the most extensive and beautiful gold fillings the dentist had ever seen; but between all the molars and bicuspids were deep depressions of gum tissue into which a small pea could have been dropped, and the calcareous deposits extended solidly from one tooth to another, pressing the gums away. The patient was told of the condition and that it was probably the cause of his suffering. "Why," he replied, "I had my teeth cleaned just before I left home a few months ago." After the operation was

finished, which gave him complete relief, he said, "Well, I never had anything like *that* done before." Now that patient had been under the care of the same dentist for years, a man of deservedly high reputation for skill, the evidence of which was apparent in the patient's mouth, and, alas, the evidence as well of his unpardonable neglect.

Another practitioner tells of a lady from a distant city who applied to him in great distress to know if anything could be done to preserve the few teeth still remaining in her head. She stated that she had been under the care of a well-known dentist, one of high repute, for twenty years, visiting him regularly every six months, and he had told her nothing could be done except to extract them. The dentist to whom she last applied said that the teeth were so loose they could almost have been removed with the fingers, and from the fact that her former dentist, in whose skill he had the fullest confidence, had assured her nothing could be done, he gave her no encouragement. But as she persisted in having the attempt to save them made, he removed the deposits, which extended nearly to the apical ends of the roots. This was easily accomplished, and with only three simple treatments he dismissed her for a month, at the end of which time the teeth were very much more firm; and two years after they were as firm in her jaw as any teeth with so extensive recession of the gums and absorption of the margins of the alveolar processes could ever be. She made the same remark as the first patient, "Why, my dentist never did that." Of course he did not do "that," and the neglect caused the trouble.

A young married woman who had been a patient of a certain dentist up to the time of her marriage, called upon him some time after that event and asked "if it was not necessary to remove the deposits from the teeth?" He told her that it was very important. She replied, "I knew you always removed them, but when I applied to Dr. Blank (her husband's dentist) to have them removed, he told me they must not be touched; that it was very improper to do so." This man had been in practice for over twenty years, and was of good repute in the community.

Now here were three men of high repute and of known skill in other matters, either ignorant or indifferent regarding this most important operation; criminal, whichever horn of the dilemma is

accepted. These are but three out of hundreds of cases which might be cited, and such cases are constantly to be observed. One gentleman says he had two dentists, both of high standing, from widely separated parts of the country, as patients for this operation, and from their remarks, questions and admissions it was evident that they knew very little about the proper treatment and methods of removal of these deposits. One of them thanked the operator very gratefully and said he would hereafter treat such cases more intelligently and thoroughly.

This is a deplorable state of affairs. How is it to be accounted for? It is true that few of the text-books treat this subject with the fullness its importance demands, in fact but one, "The American System of Dentistry," gives it much attention. Dr. Harlan, in this work, does call attention to its great importance and gives in some detail the methods of operating, but not with half the earnestness the subject requires. Students would gather from reading the other text-books that it was not a serious matter, even if neglected; yet it is safe to assert that more teeth are lost from neglect to remove these deposits than are destroyed by caries. Then, too, most of the writers speak of the operation as if it were the most simple one the dentist is called upon to to perform, requiring no special skill; yet there is no operation which requires at times so great skill, in which the "Tactus Eruditus," of which Dr. Kirk writes so admirably, is so essential, and its conscientious application so imperatively demanded.

It is to be greatly feared that this phase of operative dentistry is not sufficiently or thoroughly taught in our schools. All those who have taught in this department are well aware of the difficulty of getting students to treat such cases, and the obstacles in the way of teaching this operation are so great that it is not to be wondered at that teachers sometimes become so discouraged as to neglect in a measure this most important line of instruction. Nevertheless, it is most earnestly to be desired that greater attention shall hereafter be given to this matter in our dental colleges.

But suppose the text-books entirely ignored this subject, that would not be a sufficient excuse for this prevalent neglect, especially in view of the fact that our dental journals have brought to us monthly papers and discussions which for the past few years

have teemed with methods of treatment of pyorrhea alveolaris, both in its therapeutic and operative phases, in which the absolute removal of all deposits is acknowledged to be the chief factor. One could not fail to become educated in this direction if he read the journals with a view to enlarge his sphere of usefulness. Even the catalogues of the dental depots would prove largely educational to one noting the many admirable and delicate instruments at present manufactured for this operation.

What then can explain this indifference to and neglect of so very important an operation, and what can be done to arouse the proper spirit and so enhance the beneficence of our calling?

The purpose of this paper will have been accomplished if it stimulates those who wield a more trenchant pen than the writer, to so bring this matter before the profession at large as to force the delinquents into better practices and so to obliterate eventually this blot on the profession.

ANTERIOR TEETH.

By Dr. D. Murlless, Holyoke, Mass.; Read Before the Union Meeting of the New England and Conn. Valley Dental Societies, at Worcester, Oct. 23-25, 1895.

I ask your attention to a method of repairing and preserving badly broken down and decayed anterior teeth by means of crowns and shells; which method I will give briefly, asking you to supply your own experience and judgment where my explanation seems too short.

It has been the paramount custom in preserving the anterior teeth to fill them with gold. We all fully realize that the best of skill and the most patient efforts are necessarily expended on operations of filling the incisors, as they are of great importance to the personal appearance of the possessor. Since gold must necessarily be used in the great majority of cases, many of the operations are very difficult and expensive, and neither operator nor patient can afford to have them fail. And when one stops to consider and examine, it is wonderful what skill and patience are expended in connecting so closely and firmly so solid a metal as gold with so thin and frail a thing as the average decayed incisor

s; and besides being wonderful, when the gold is shaped and smoothly finished to the tooth, is it not a beautiful piece of work? It is marvelous that a tooth so treated will stand so much strain without either itself or the gold fracturing.

With the advance of dentistry came the hope of easier and better means of repairing such teeth, and many devices were brought out for this purpose, such as inlays and porcelain crowns of various kinds. Inlays for corners, and crowns, are desirable for their beauty and natural appearance, but their great fault is weakness; they are weakest just where they should be strongest, *i. e.*, at the neck of the tooth. Nature and necessity require strength at this point, and there is always danger of breaking the pivot or fracturing the root, aside from the unavoidable necessity of devitalizing the pulp. Gold contours are liable to fracture, as there are many cases where it is almost impossible to retain a filling, there not being sufficient tooth structure to support so large a piece or corner of gold.

Now if we consider an incisor with a third, a half, or even more, decayed and broken down from the aproximal and cutting edge, taking away a large corner of the tooth, and in many cases containing a live pulp, and when we reflect on the troublesome consequences of death of the pulp, or even pulp irritation, which is very likely to follow filling, we see that it is imperatively demanded that the effort at pulp-conservation be made. Such a tooth as I have described can be filled and restored to its original size and shape, by first filling with some plastic, and then putting on a gold cap or crown, with an opening in its face of such shape and size as will just cover the margin of the cavity, having but very little more gold in view than would be seen if the tooth had simply been filled.

There are many advantages in this method, as teeth can be saved that it would be nearly impossible to preserve by other treatments; for example, many times we find the molars of the lower set lost, and persons in such a condition in using their teeth bring the lower incisors against the lingual side of the uppers. Where they have been thus used for some time the lower teeth will be worn on the cutting edge and shortened, and the lingual surface of the uppers will be worn by abrasion, so much so that the under side of the uppers will often be worn away, forming a

shoulder at the neck of the tooth, and occasionally the labial surface will be worn thin. In such cases there is no way to retain a filling, but the tooth can be backed up with cement, and a cap, such as I have described, be telescoped over it. By this means the cutting edge is thoroughly protected, the whole tooth bound and held firmly together, and we may say it is as strong and serviceable as ever and needs no more care than if it were perfectly sound. I had successfully used this method in my own mouth some time before I saw it spoken of anywhere.

CHEMICAL OPENING AND STERILIZATION OF ROOT-CANALS.

A Clinic Before the Union Meeting of the New England and Conn. Valley Dental Societies, at Worcester, Oct. 23-25, 1895, by A. C. Hull, D. D. S., Worcester.

After putting on rubber-dam, I open into pulp-chamber with burs, etc. I then take a very small pellet of cotton with the pliers, saturate cotton with H_2SO_4 (sulphuric acid,) and place in chamber. By capillary attraction and moisture, for which the acid has an affinity, it will draw up into canals; I also assist it to enter channels by the use of a very fine Donaldson broach. I let acid remain about one minute, then neutralize by applying a strong solution of bicarbonate of soda; this causes quite a violent reaction, and carbonic acid gas is liberated, and sulphate of soda is precipitated. By the generation of the above gas the canals are pumped free of any debris and broken down lime-salts.

After this reaction has subsided I wash out with peroxide of hydrogen, three per cent.; this removes the crystals of sulphate of soda, then proceed as before with another application of acid, and neutralize with soda, until I have opened two-thirds of the distance, or a little more, to the apex. I then substitute HCl (Hydrochloric Acid), for H_2SO_4 (sulphuric acid), and chlorinated soda for neutralizing agent, in place of N_aHCO_3 (bicarbonate of soda). The reason for this change is that we are nearing a point where we are to take into consideration, not only the tooth structure, but the tissues beyond the apex; therefore I substitute

HCl, (hydrochloric acid,) which has, in addition to its escharotic effect, disinfecting properties; also, as a tonic and astringent it is of great value in the treatment of tissues beyond apex in cases of induration and soreness. In substituting chlorinated soda we get a fairly good reacting and neutralizing agent, an antiseptic, deodorizer, stimulant and tonic for tissues beyond the apex, also a very good bleaching agent for tooth structure. The bleaching properties of the above are increased by the action of the acid, which liberates chlorine.

I use sulphuric acid at first, as it breaks down lime-salts more quickly, and bicarbonate of soda as a neutralizing agent produces a more violent reaction and a greater amount of carbonic acid gas is liberated, which pumps out all debris from canals; but after it has performed this office, it has exhausted all its resources. By substituting chlorinated soda, I get its useful properties, already mentioned, and a reacting and neutralizing agent that will do for the latter stage of the operation.

If there are indurated or inflamed tissues about the tooth, I have no hesitation in working just the point of the broach through foramina of buccal roots, which would carry with it a very little acid. This will not increase the irritation, but, on the contrary, will often relieve the same by cauterizing the tissues and destroying germs of inflammation.

The only broach I have used with success in these operations is a very fine Donaldson, with the hook or angle cut off at point, making an extremely fine, straight, and unbarbed broach. These have hard rubber handles and can be found at any dental depot.

For filling root-canals I use chlora-percha, quite thin; let it draw up into canals, then take a gutta-percha point on root-canal plugger and force the same into channel, which acts as a piston to carry filling to the apex.

In regard to care of instruments used during the operation, would say, I have on my operating table a strong solution of bicarbonate of soda into which I dip my instruments from time time to neutralize acid.

This method will be found useful in treating cases the condition of which are like the following: a pulp which we have attempted to devitalize, and have succeeded in removing all but a small portion near apex, this being in an extremely sensitive con-

dition and stubbornly resisting all treatment and medication. These cases cause great suffering to the patient and are a source of great annoyance to the dentist, but quickly yield to this method with very little or no pain to the patient.

BRICKS WITHOUT STRAW.

By Geo. L. Parmele, D. D. S., Hartford, Conn.; Read Before the Union Meeting of the New England and Conn. Valley Dental Societies, at Worcester, Oct. 23-25, 1895.

Many of you no doubt remember Artemus Ward's old lecture on "The Babes in the Woods," in which no reference whatever is made to either infants or forests. Should my talk be of a similar nature as regards the title, you need feel no surprise. Bricks made without straw crumble easily, and have not, so to speak, sufficient strength of character to be of value to mankind. Now in our dental life and work we may readily find some things that may be likened to strawless bricks, such as the dentist who has lost his identity; that is, one who identifies himself with nothing, unless it be with some church, lodge, or military company, for the business he hopes to pull out of it. He has no object in life except the 'almighty dollar,' accomplishes no good, has no object in being. He is making bricks without straw. There are hundreds of this class right here in New England. You have never heard of them before? Why? Because they have become indifferent to their own interests and take no interest in the lives of others. They have never written a word for a dental journal; have never joined their city, state, or national association; they are simply running along in the same old rut, caring for nothing but that living which, they say, the world owes them, but which they are too indifferent to collect. To them, I say, let the profession know where you are; identify yourself with its interests; join your state and local societies, make yourself known at the meetings and be active in them. Take at least one live dental journal. Think. Have something to say and say it at these meetings. Make the members of the societies always pleased to welcome you. Do not, however, always talk shop. There are other things of interest in the world besides dentistry. Be jolly, too. Give

and take a bit of fun, and enjoy yourself while you live, for when you are dead you will be dead a long time.

Papers are often delivered and printed which certainly appear to be devoid of straw. It seems to me there is far too much writing simply for the sake of writing. This advice from the Surgeon General's office, to those about to write for periodicals, will bear repeating: 1st, have something to say; 2d, say it; 3rd, stop as soon as you have said it; 4th, give your paper a proper title.

There is also considerable talk at our meetings, principally by the man "who has never had a failure;" talk consisting largely of mud, with perhaps here and there a straw; statements that will not bear sun-drying, that will not resist the pressure of use. One writer seems to be so impressed with this fact that he suggests that "young men should learn not to monkey with ideas picked up at dental meetings." In spite of the fact that dental meetings are of the utmost value, there is still some sense in the remark, so while the young practitioner should attend such gatherings as often as he can, he should also heed the advice. Let him carefully consider all the ideas set forth and see if they contain sufficient straw to make them of value, before he finally adopts them.

Urging a man to write a paper on some subject he knows he cannot properly treat, in order to make the program look attractive, is asking him to produce bricks without the requisite materials. Lastly, electing officers and appointing executive committees and expecting them to get up interesting and valuable meetings without your hearty co-operation, is asking them to labor as did the oppressed "Children of Israel." Notwithstanding the fact that like an old hat, I have been used to stop a gap, if what I have hastily thrown together has at all lightened the duties of our hard-worked secretary and committee, I am pleased.

A young man once delivered an address, and when he got through he asked a friend; "Well, don't you think that was a finished address?" "Yes," said the friend, "I do, but there was one time when I thought it never would be." Rather than have this said of my paper, I will stop. I think it was Longfellow who said, "Let us then be grateful to writers for what is left in the inkstand; When to leave off is an art that is only attained by a few."

FILLING WITH GOLD: EXPERIENCES WITH THE LIBBY METHOD OF BURNISHING.

By Dr. C. L. Dodge, Fall River, Mass., Read Before the Union Meeting of the New England and Conn. Valley Dental Societies, at Worcester, Oct. 23-25, 1895.

In presenting this paper for your consideration I do not claim new or original ideas, but simply place before you some of the methods I am practicing with a good degree of success. Some of these features I may have evolved, and for others I am beholden to my professional friends, especially my present method of inserting gold fillings, it being to an extent that recently introduced to the profession by Dr. Henry F. Libby, a system of burnishing in fillings. I do not in all cases follow out his methods in their minutest details, but the underlying principles as I conceive them, the protection of frail enamel walls, (and they are all frail in a degree,) and the close adaptation of the filling to these walls, are carried out by these methods. During the fifteen months I have been practicing this method I feel I have accomplished better results than ever before.

Let us first consider the preparation of the cavities. The underlying principle or foundation of success with gold, as with other fillings, is a proper cleansing and shaping of the cavity. Undercuts which will prevent the rolling of the filling when under pressure, are a necessity where they can consistently be obtained. Where this is not possible, other methods must be resorted to, but be sure you have your filling well anchored, so that when "the rains descend and the floods come and beat upon" that filling, it will stand because it is well anchored in the tooth.

Let us take for example an aproximal cavity in a superior incisor. After thoroughly cleansing the cavity of decayed matter, we commence at the cervical portion of the cavity with a drill or bur, making a small pit toward the lingual surface and upward, and another toward the buccal surface and upward, and between and connecting these pits, a channel. We then bottom the channel and pits with an oval or inverted cone bur, forming an undercut within an undercut and one from which gold thoroughly packed cannot draw. We prefer the oval bur as causing less pain to the patient than the acute angle and sharp corner of the in-

verted cone, and as also allowing a more thorough packing and adaptation of the gold to all portions of the undercut. Having obtained our undercut at this part of the cavity, we now turn our attention to the incising portion. Here we endeavor to obtain an undercut which will be as nearly similar to that at the cervical portion as possible. But owing to the narrowness of the cavity at this point and the danger of impinging upon and fracturing the enamel, we can generally get but one retaining pit, which we bottom as before. From these pits and undercuts we start our filling which, when completed, is thoroughly dovetailed into the cavity.

Let us now consider a cavity similarly located, and one which often presents itself, where the walls are so far destroyed that it is not possible, consistently with safety, to get these undercuts; a cavity not in the least well shaped for holding a filling. In such a case we use anchor screw posts, upon which we find we can generally place great reliance. These posts, being not over 1-32 of an inch in diameter and ⅛ long, are well adapted to this work, as they are not large enough to occupy much room in the cavity and are sufficiently so to insure a good and secure anchorage. If the condition of the cavity warrants undercuts at the cervical, but is badly broken away at the incising portion, and this means what is usually termed a contour filling, we use the post only at this point, inclining the top toward the cervical margin, thus forming a lock for the filling. We will now look at the margins of the cavity. If they are very thin and frail we cut them away until we have a firm substantial margin, for unless we attend well to this feature we soon find them crumbling, if they do not during the manipulation of the filling. Having so trimmed them, we now slightly bevel the outer edge back from the cavity, just enough to corner them as it were. They are now in a condition to burnish the gold upon without danger of disintegration. We would say at this point that we generally apply the rubber-dam previous to making our undercuts. Our method being to take in not only the teeth to be filled, but one on either side of these, having a double object in view in taking in these extra teeth, one being to obtain more room in which to work, the other, to more effectually secure the cavity against leakage of saliva, for we frequently find it oozing out around the outer tooth, there being a

liability of more strain upon the rubber at this point. In ligating the teeth after the rubber is in position, our method is to make a double turn of the ligature around the neck of the tooth, then a double turn of one end around the other, drawing the ends tight, thus making the first part of the knot. This will obviate slipping while we are tying the second part, which when completed will be what I understand to be a square or surgeon's knot. We can now feel reasonably sure the ligature will remain in position and more effectually prevent leakage than when only a single turn is taken. Perhaps it may appear to you that this double tying will be unnecessarily bulky and more painful to the patient, but the proof of the pudding being in the eating, I would suggest that you try it, and I feel you will be sufficiently well pleased with the result to continue its use.

Owing to the great competition for work in our line, and the general desire on the part of our patients to obtain this work at the smallest possible cost to themselves, the incentive is quite general among operators to accomplish it in the least possible time and with the least possible cost for material. This is a sad mistake. The axiom, "What is worth doing at all is worth doing well," was never more applicable than it is to the operations performed by the dentist. We are operating upon living tissue, and if the work is not properly performed, no amount of afterwork can fully remedy the defect caused by hasty and ill-performed operations. We can purchase gold and other materials at pretty much our own price, but we seldom get more than we pay for, in this line as in others, and let me say, gentlemen, that in nine cases in ten, when we try to save a dollar in this way we eventually lose two.

Dr. Libby's method in filling these cavities, as I have seen it practiced by him, is to fill the undercut with a serrated point hand-plugger until he has obtained a firm anchorage of gold, then with the corkscrew-shaped burnisher, first passed over the gold, he carries it, piece by piece, burnishing each piece into position as it is carried, as the margin of the cavities are reached. We who have used the mallet so constantly in the past, begin to realize what, to our minds, is the most beautiful feature of this method. We experience no fear of disintegration of the marginal walls, for the gold is gently burnished up to and over them, with a close adap-

tation which will not fail to show to good advantage later. The sense of security and comfort we feel at this point of the work is delightful, and when we have trimmed and finished our fillings, upon close examination of these margins we see no reason for feeling differently. In the years I have used the automatic mallet my mind has been greatly exercised upon this point, and while taking every precaution to prevent it, I never felt sure that this disintegration did not exist. For although it might not fully show at the time of the operation, I felt that the integrity of the tissue at this point was liable to be greatly impaired, if not by actual contact with the instrument, at least by the shock. But with this method of filling a greater sense of security exists.

We have often heard it remarked that a firm, dense filling could not be obtained by the method of burnishing. This is a decided mistake. The fillings I insert today I feel are in every respect as dense as those I used to insert with the mallet. I wish to say here that pressure upon the gold with the burnisher must be exerted to just the right degree to produce the most satisfactory results. Too much pressure, too heavy and long continued burnishing, causes the gold to become brittle and causes danger of cleaving from the main body. A moderate pressure, properly exerted, will produce a firm, dense filling and one in every way satisfactory.

There is a feature of this work which may not be readily recognized at first—it is this, It is extremely necessary that the instruments should have and retain a fine polished surface, otherwise we may find in the process that instead of passing over the gold smoothly, the instrument drags. This is caused by a slight coating of gold upon the instrument. We cannot accomplish satisfactory results while this condition exists, but a moment's application of the instrument to the buff wheel will remedy this trouble. It is well to send the burnishers to the laboratory to be buffed after each operation. This occupies only a few moments of time and well repays the trouble.

At the time of my starting in upon this work I ordered through Dr. Libby a complete set of his instruments. When they were received I examined them with a strong magnifying glass, finding in them many scratches and much unevenness of surface. I immediately set to work to remedy this defect, by buffing them

with buffs of chamois skin and cotton-flannel, using rouge for the final finish, with the result that upon again examining with the glass, a fine, highly polished surface was presented. I feel that this surface is necessary to produce the best results.

In the insertion of these fillings we do not always confine ourselves to the burnisher from start to finish, especially in the cases where the anchor screws have been used. In these cases we fill with hand-pluggers until we have covered the posts, when we finish with the burnisher. I have used in connection with the instruments furnished by Dr. Libby, an instrument I have had made, corkscrew-shaped with a ball end. These are made right and left and of varying lengths. I find them valuable adjuncts to the Libby set.

And now one word in regard to finishing our fillings, and this is a matter of no slight importance, for it is necessary that this part of the work should be as thoroughly performed as the previous portions. We have reached a point in the operation where, especially if the filling is large, owing to the close application required, we are somewhat tired and willing to see the end. Our patient also is often very anxiously inquiring if we are nearly through, expressing a willingness to be satisfied with the operation if we do not carry it further, and the incentive is often strong to yield to this pressure. This, however, will never do, for unless we have finished our filling absolutely flush with the cavity margin, the overlapping edges of gold will surely cause future trouble, by holding secretions, etc., which will eventually render inefficient what otherwise would be good work.

THE SAVAGES ARE, UNCONSCIOUSLY, BACTERIOLOGISTS.—M. Dantec has demonstrated that the arrow poison used by the natives of the New Hebrides contains neither serpent venom nor vegetable extract. It contains two deadly disease germs—the vibrion septique, which causes that form of blood poisoning known as malignant edema, destroying life in from twelve to fifteen hours if still alive, and the bacillus of tetanus, which, if the former poison prove inert, will finish up the unlucky victim in a much longer time. The poison is obtained from the earth in certain marshy places. The horse cannot be the origin of the tetanus germ, as that animal is unknown in that entire group of islands.—*Am. Microscopical Jour.*

Digests.

The Ohio Dental Journal for October, 1895.

"A Study in Dental Anesthesia," by N. S. Hoff, D. D. S., Ann Arbor, Mich.; read before the Tri-State Dental Meeting, June, 1895. *Nitrous Oxid.* Its comparative safety has made it popular for all brief surgical operations, but it has several objectionable features, chief of which is the tendency to produce symptoms similar to asphyxia and consequent dangerous results. Where oxygen is combined with nitrous oxid in some form as a corrective, this tendency can be successfully overcome. The advantages of mixing lie in the fact that the asphyxiating symptoms are delayed or prevented, and a larger quantity of nitrous oxid is pre sented to the sensory tissues and consequently more profound anesthesia results. More time is required for effects, but a somewhat relative lengthening of the period of insensibility follows. Prof. Paul Bert succeeded in maintaining complete anesthesia for 26 minutes with a mixture of N_2 O O, with no unpleasant symptoms of any sort, by administering the mixture under a pressure of one and one-half atmospheres. Prof. Hillischer obtained complete anesthesia for a shorter period with a similar mixture without the addition of atmospheric pressure. Prof. Hewitt, after experimenting in over 800 cases, concluded it was a practicable idea and invented an appliance for mixing and administering these gases. He found that from 10 to 12 per cent. solution of O in N_2 O answered general purposes, but that individuals required modification of the formula, and that an apparatus capable of ready and quick adjustment was necessary to meet various symptoms as they arose, and that no diagnosis was possible by which the best proportions of the gases could be prepared in advance, but the oxygen supply must be brought on as needed. In using this mixture and apparatus in 67 tabulated administrations, it was found that anesthesia was brought on in 66 seconds as the shortest and 186 seconds as the longest period, and the shortest duration of complete anesthesia was 44 seconds and the longest 80 seconds. It was observed that recovery was not so prompt as with N_2 O alone.

The quantity of O will vary with different persons and must be controlled by the administrator. It is best to begin with a small percentage and gradually increase it as indications demand. Excitement stage is shorter with a smaller per cent. of O. The face piece must fit accurately to exclude all air. Silence and an absence of contact with the patient are essential to quiet and successful results without excitement or violence. The margin between the peaceful anesthesia of the mixture and the usual manifestations of nitrous oxid is so narrow that the patient must be closely watched. More oxygen should be given to debilitated or weak persons than to strong-minded, stubborn or vigorous ones. The conjunctival reflex is the best indication of complete anesthesia, but snoring and relaxation are also useful indications. The first application of the forceps will sometimes get a slight reflex response, but not sufficient to require any further anesthetic. Patients do not have the horrible dreams nor scream under the mixture as they do with nitrous oxid alone. They also feel better on recovering and present a better appearance. The tongue and mucous membrane are not congested or swollen. The mixture acts well in cases of weak circulation, as the pulse is stronger and steadier without the usual primary excitement of nitrous oxid and none of its depressing after effects. The unfavorable action of the mixture causes considerable prostration, due to the longer and more complete anesthesia. A feeling of nausea and sometimes vomiting. More time must be given to recovery. More skill is required to administer it and pay attention to the manifestations and prompt application of remedial measures. More time is consumed in the operation. It is recommended for use in children, anemic and debilitated patients; persons easily anesthetized by nitrous oxid. Persons who do not take nitrous oxid kindly; old people, persons with diseased circulatory organs.

Some points for further study and investigation in this connection. I would suggest the following: (1.) The use of gasometers to obtain required and uniform pressure, and the amount of pressure necessary to secure the best mixing or diffusion of the gases in definite proportions. (2.) The extent to which this mixture may be used without injurious results, such as the paralysis of the vital nerve centers experienced with other anesthetics. (3.) A qualitative analysis of the blood under complete anes-

thesia with the mixture, with special reference to its oxygen. (4.) A careful experimentation as to the ultimate physiological effect upon the sensory tissues.

Cocain. When I first used cocain I was tempted to give it up because of the difficulties and dangers attending its use, but its satisfactory obtundent qualities compelled me to continue its use, so I began experimenting to make the drug practicable and safe. I began with a 6 per cent. solution for hypodermic use and on the basis that one grain could be safely used as a dose. I soon discovered that either the dose or concentration was entirely too high, and I now know both were. I experimented with various solutions and finally concluded that for hypodermic injections a 2 per cent. solution in water was sufficiently saturated for any purpose, even for use in anesthetizing pulps, and in the majority of cases where it can be used, a 1 per cent. solution would accomplish definite and satisfactory results. I have even secured very satisfactory anesthesia, for extracting a tooth, with a solution of the strength of 1-5 of 1 per cent. The dose of cocain I have gradually reduced from 1 grain hypodermically to from 1-16 to ½ gr.

It is well known to all that the great objection to cocain lies in its tendency to induce hysteria, when given in small doses, due to its stimulant effect upon the nervous system; and secondly, its depressing action upon the respiration and heart when used in excessive doses. The tendency to hysteria and respiratory difficulties are the most important complications to consider, for the reason that they occur when least expected and sometimes with small doses, while the depressing heart effects only occur in peculiarly weak conditions of this organ, or as secondary to the respiratory difficulties, or because of excessive dosage. My first experiments to control this nervous excitement were with the standard narcotics, morphin and chloral. I soon found that many persons were highly susceptible to the use of morphin and that chloral was objectionable because of its bulk and its excessive irritating character when injected into the soft tissues, causing sloughing of the tissues. The experiments of Dr. Pruyn convinced me that morphin was the most accessible drug to control this excitement effect, and on looking it up I found that atropin was morphin's great antagonist, especially against its poisonous

and nauseating effects. I therefore began using a combination of cocain, morphin and atropin, and soon found that I had a satisfactorily corrected formula, that the drugs seemed to harmonize therapeutically in producing a more powerful local anesthesia, and that systemic disturbances were very rare with proper doses. This combination I am now using as a local obtundent with good results. I use sterilized water to make the solution, and to prevent possible decomposition make the solution fresh daily or as needed for use. The formula I use is as follows:

R. Cocain .....gr. ½.
Sulfate of Morphin.....gr. ⅛.
Sulfate of Atropin.....gr. $\frac{1}{200}$.
Sterilized water, gtts ..... xxx.
Mix and inject hypoder. gtts., v to xv.

For convenience I have had the cocain, morphin and atropin made into soluble tablets by Parke, Davis & Co., of Detroit, and in this way solutions of any strength desired may be quickly and accurately made with little or no inconvenience. The sterilized water I use is distilled water containing from 8 to 10 per cent. of listerine or euthymol to keep it sterile. If you desire to make a 2 per cent. solution, all that is necessary is to dissolve one of the tablets in twenty-five minims of water. A 1 per cent. solution can be made by dissolving one tablet in twice this quantity of water, or fifty minims. A 4 per cent. solution can be made either by reducing the water one-half or adding another tablet to the twenty-five minims, etc., etc. The advantage of this method of making solutions is that you can always have pure, clean solutions and the preparations are portable in small compass. The drugs used in the tablets are the purest that can be had and the firm assure me they are especially careful in filling all such orders. Another advantage is that other correctives or adjuvants may be added to this formula when the solutions are made.

In my opinion the manner of using cocain in dental practice has much to do with the disrepute into which this most valuable drug has fallen. It is an excessively poisonous substance and must be used with the greatest caution and care. There is a tolerably well marked outline beyond which clinical experience has demonstrated one cannot go without hazard. Not more than one-half grain, nor in stronger than 2 per cent. solution, should

ever be used at one sitting as a hypodermic injection. It should be used with a clean syringe in perfect order and injected only a little faster than the tissue will absorb it. Excessive pressure on the syringe will cause irritant results and introduce more of the drug than is necessary to produce desired effects. All excess or overflow should be prevented or absorbed before it comes into contact with the tongue, as it will be quickly absorbed by that organ, or if swallowed will produce paralysis of the pharyngeal and laryngeal muscles and induce dyspnea and develop hysterical symptoms. The best systemic fortifier is coffee or food.

Journal of the Franklin Institute for November, 1895.

"ALUMINIUM SOLDERS," by Joseph Richards, read before the Institute. As soon as aluminium came into general use it was found that it was very difficult to solder it satisfactorily. The ordinary alloys used for soldering would not attach themselves to it, despite every usual precaution, and it was seen that unusual solders must be devised. M. Christofle, the goldsmith of Paris, discovered that aluminium was wetted by, and could therefore be soldered with, either pure zinc or pure tin. It is indeed true that both these metals hold firmly to the aluminium, but the zinc seam is brittle and crystalline, will not stand working, and discolors badly in a short time, while the tin seam has the disadvantage of disintegrating and falling to pieces in a few weeks. This latter phenomenon is due to the fact that certain alloys of tin and aluminium will decompose spontaneously by the action of the air. This is particularly true of tin containing small proportions of aluminium, up to 10 per cent.; for, if a bar of such alloy is left in the air, and portions are broken off at regular intervals, a change will be visible in the section, proceeding from the outside towards the centre; and while at first the alloy is strong and tough, it gradually becomes more and more friable until, at length, when the change has reached the centre, it breaks like a pipe-stem. I have observed a bar, 1-16 inch thick, to become decomposed all through in three weeks, and on thinner sections the effect is still more marked. Tin containing 0·5 per cent, of aluminium was rolled by a Philadelphia maker of tin-foil into foil 0·001 inch thick, and, while it rolled beautifully, yet it two hours thereafter the whole sheet was as brittle as glass. Now, bearing these facts

in mind, it can easily be understood why a joint soldered with tin falls apart. The tin attaches itself to the aluminium by forming an alloy at the junction, and this alloy decomposes in a short time. Alloys of aluminium and zinc were tried by the Tissier Bros., but were found to be too brittle. M. Hulot proposed to first plate the aluminium at the joints with copper, and to solder coppered surface with ordinary solder. The best solders of Mourey, a Parisian goldsmith, were alloys of aluminium and zinc, to which small proportions of copper were added, to give them toughness. The chief difficulty with these solders is their high melting-point; the zinc, which melts only at incipient red heat, being the most easily fusible ingredient. For brazing and blowpipe works, such high-melting alloys can be used, and the addition of a little silver improves them still more; but none of them can be regarded as convenient for use with the soldering-iron. It has been claimed that by using silver chloride as a flux, aluminium can be soldered in the ordinary way with ordinary tin solder; but this method has not proved satisfactory in practice, and, even if it were, the flux is too expensive.

Starting with a full understanding of the difficulties of the problem, and a knowledge of what had been previously tried and found wanting, I proceeded with the object of finding, if possible, a solder which should have the following qualifications: (1) It must wet the aluminium and adhere firmly; (2) It must not disintegrate after exposure to the air; (3) It must be as malleable and strong as aluminium; (4) It must have a low melting-point, so as to be easily worked with a soldering-iron; (5) It must have the same color as aluminium, and not change color; (6) It must be cheap enough for general use. After experimenting about two years, it was finally found that an alloy of zinc and tin in certain proportions, containing a little aluminium and some *phosphorus*, realized almost every qualification. The alloy used for some time was made by fusing together: Aluminium—1 part; ten per cent. phosphor-tin—1 part; zinc—8 parts; tin—32 parts.

It was found, however, that, on re-melting this solder, a more fusible alloy liquated away from it. It appeared reasonable to assume that this more fusible part was a true alloy of zinc and tin, and, therefore, a more stable compound. This fusible portion was also found to solder better than the original mixture. This

liquated solder was therefore analyzed, with the result that its composition was found to be very close to that expressed by the formula Sn_4Zn_3. The solder which I now use is made to correspond closely to this formula. It is obtained by using the ingredients in the proportions 1, 1, 11, 29, instead of 1, 1, 8, 32, as previously described. The percentage composition of the several alloys described may be thus compared:

	Original Solder.	Found in the Liquated Alloy.	The Formula Sn_4Zn_3 Calls for	Solder as now made, Contains	
Aluminium..	2·38	—	—	2·38	Zinc+Aluminium, 28·57 per cent.
Zinc.....	19·04	—	29·3	26·19	
Tin.....	78·34	71·65	70·7	71·19	
Phosphorus..	0·24	—	—	0·24	

The percentage of zinc in the new solder is lower than called for by the formula Sn_4Zn_3; but since aluminium and zinc are metals having many physical analogies, it was thought advisable to bring the combined percentage of these up to that required for the zinc alone. Further, as the tin is most liable to lose by oxidation during the mixing of the solder, it was thought best to have it slightly in excess.

The Western Dental Journal for November, 1895.

"Epilepsy from Dental Irritation," by J. D. Patterson, D. D. S., Kansas City, Mo.; read before the Odontographs of Kansas City, Nov. 9, 1895. In 1876, at Lawrence, Kas., I was called to assist in the treatment of a patient suffering from frequent attacks of epileptic spasms, and the outcome of the case showed so clearly the connection between dental irritation and reflex neuroses that since then I have carefully noticed such manifestations. The case at Lawrence was a girl, aged 8 years, who for a year before frequently suffered with spasms or convulsions, which would come on without warning. At school, at home, or at play, she would be seized with these fits, accompanied by violent muscular contractions in various parts of the body. At one time these contractions would force the fingers of the hand into unnatural and rigid positions, at times only one finger doubling up, and again all the fingers clasped tightly, the nails leaving their imprint upon

the palm. Similar contractions would appear in the toes of the feet. In one spasm, which I witnessed myself, the hand at the wrist-joint was bent at a right angle with the arm and could not be straightened until the spasm passed. The usual methods of treatment, by two physicians, long instituted, had failed to give permanent relief, and by their advice she came for treatment for dental irritation. There were no decayed teeth. The eruption of the permanent teeth were in various stages and considerably delayed. Noting the points where irritation appeared from coming teeth and delayed shedding of deciduous teeth, I lanced the gums and removed deciduous teeth where there was suspicion of irritation, with the result that the epileptic seizures ceased. This was repeated whenever these attacks came on, and it is sufficient to say that relief was always complete. Not until all the permanent teeth were completely erupted did the attacks entirely cease. The patient, at first a strong, healthy girl, became anemic, while the earlier treatment was of no avail; but rapidly improved when the relief from dental irritation was instituted, became strong, and is now the mother of a family. The epileptic spasms had not returned up to three years ago, when I last could hear from her.

Passing over somewhat similar but slight experiences in other cases, I will direct your attention to a patient, a lad now under my charge, who some three years since, when at the age of 7, commenced having fainting spells or fits, which puzzled all who were called in consultation. It was called epilepsy, St. Vitus's dance and hysteria by various physicians and surgeons. The patient was treated variously, some believing that stomach trouble caused the attacks; others that an old attack of diphtheria had left its mark; others that ocular difficulties existed; that the viscera was affected; that malaria was present, or that self-abuse was at the bottom of the trouble. Through all the varied treatments no permanent relief had been attained. The spasms, first presenting at the rate of two or three a day, increased to at times fifty or sixty in twenty-four hours. During the first year of this patient's trouble I extracted for him a deciduous superior lateral which was delaying the eruption of its successor, and shortly afterward made a thorough examination to ascertain if any dental irritation existed which would cause the epileptic spasms. I could find none, and gave up the idea that the teeth were concerned in the distressing

disease. When the boy returned home, about four months since, his physical condition had suffered very much; emaciation and an insane expression were the principal appearances noted. Some three months ago, one Sunday morning, I was going into the city and on the cars sat next to the father and his invalid son. It was noticed that the boy's face was somewhat swollen upon the right side. I induced them to come to my office, and, there being some inflammation over the deciduous molars, I removed all of the remaining deciduous teeth upon the right superior maxilla. A very few days later one of the permanent bicuspids made its appearance, and the improvement in the patient was marked, the spasms being fewer and less severe.

Four weeks ago to-morrow I removed all of the remaining deciduous teeth, now believing that, after all, dental irritation was at the root of the difficulty. The teeth then removed were the left superior first and second premolars and cuspid, lower left second premolar and cuspid, and lower right first and second premolars and cuspid. Since that time the improvement has been notable, and we are justified in believing that when all dental irritation can be removed a cure will be effected. The boy has gained in flesh and color, and an intelligent expression has taken the place of the vacant and imbecile one. The attacks are still fewer in number and severity. Examination yesterday showed considerable inflammation upon the left inferior maxilla at the point where the second bicuspid is forcing through. I have an appointment with the patient, and will thoroughly free the coming teeth from pressure of overlying tissue. I will also fill the superior first molars, which are carious to a medium depth. These cavities have not yet reached the neighborhood of the pulp, but every experienced dentist knows that even superficial decay is at times so sensitive that reflexed lesion has resulted when the system is in a predisposed condition, and I shall endeavor to scrupulously remove every possible source of pain. When this is done, I may look for a cure. I will conclude by giving one or two points which the discussion of these cases seems to indicate as important: 1. Dental irritation may induce pathological conditions in other parts of the body, or in the nervous structures themselves, without the existence of pain—or, at least, without intimation of pain on the part of the patient. 2. If there exists any possible

dental irritation in such diseases as epilepsy, chorea, headache or insanity, remove at once all such suspected irritation. 3. "The practical lesson" is that these cases demand of the dentist a wider knowledge and more general training than we have, in order that the subleties of disease from the teeth may not deceive us.

The British Journal of Dental Science for November, 1895.

"ORAL SURGERY," by Edmund W. Roughton, B. S., M. D., (Lond.), F. R. C. S. Eng. *Odontomes.* These are tumors composed of dental tissues in varying proportions and different degrees of development, arising from tooth-germs or from teeth still in the process of growth. As the pathology of this class of tumors is intimately connected with the development of the teeth, it will be well to remind the reader how a tooth is formed. Early in intra-uterine life the epithelium of the gum sends down a process into the subjacent tissue extending the whole length of the jaw (*common enamel germ*). From the deep aspect of the common enamel germ a number of flask-shaped epithelial bodies project (*special enamel germs*). Each is connected with the common enamel germ by a narrow band of epithelial cells (*funicular bands*). Each special enamel germ is met and indented by a differentiated portion of the subjacent connective tissue (*dental papilla*), the arrangement being comparable to a finger pressed into a flaccid india-rubber ball. The connective tissue around the papilla and enamel germ becomes fibrillated and forms a kind of capsule (*dental sac* or *follicular wall*). The complete structure is called a *dental follicle.* The enamel germs of those permanent teeth which replace temporary ones are formed by an outgrowth from the funicular band. Sometimes an epithelial outgrowth springs from the funicular band of the permanent tooth, and represents the enamel germ of the third dentition of some animals. The enamel germ of the first permanent molar is given off from the posterior extremity of the common enamel germ. The enamel germ of the second molar springs from the funicular band of the second. The whole of the epithelium of the enamel germs does not become converted into enamel, the funicular bands and rudimentary third enamel germs remaining as collections of cells under the gum and in the alveolo-dental ligament. Occasionally these embryonic remains spring into activity after all dental development has

ceased, giving rise to some interesting tumors to be considered presently. The permanent teeth are surrounded by bone except where the funicular band remains. In this situation there is a canal in the bone (*iter dentis*) occupied by a fibrous band (*gubernaculum*) containing epithelial remnants of the funicular band. The permanent tooth reaches the surface and is "cut" by traveling along the iter.

The following table shows at a glance the portion of the tooth and the kind of tumour attributable to each part of the embryonic structure:

EMBRYONIC STRUCTURE.	ADULT STRUCTURE.	TUMOUR.
Enamel Organ.	Enamel.	Epithelial Odontomes and one form of dencysts.
Papilla.	Dentine and Pulp.	Radicular Dentomata and Osteo-dentomata.
Dental Sac or Follicular wall.	Cementum.	Cementomata. Fibrous Odontomata. Follicular Odontomata. Compound Follicular Odontomata.
Complete germ.	Tooth.	Composite Odontomata.

Epithelial Odontome.—Although this disease was first described seventy years ago, it is only during the last few years that its true pathology has been appreciated. The older works on Surgery called it multilocular cystic disease, cystic sarcoma, and adenosarcoma; the first of these names accurately described the naked-eye appearances of the tumour, but the two other names erred in inferring the microscopical structure from the macroscopical appearances. In 1879 Falkson and Bryk recognized that the microscopical structure of the tumour was almost identical with the enamel organ. In 1882, Eve, whilst recognizing the true structure of the tumour, attributed its origin to an overgrowth of the epithelium of the gum of a cancerous nature, a view not in keeping with the clinical history of these growths.

Morbid Anatomy and Pathology.—These tumors most commonly affect the mandible. They grow between the plates and expand them in an irregular manner. On section, the tumor is seen to be composed of a congeries of cysts varying in size from an inch in diameter down to minute cavities too small for the eye

to perceive. The cysts usually contain a brownish mucoid fluid. They are separated from one another by solid septa which are composed partly of the expanded and displaced bone, and partly of a reddish-brown material which consists of the proper tumor substance which has not as yet become cystic. The method in which the cysts are formed is explained by a microscopic examination of a section of the solid portion of the tumor. It is then seen that the tumor consists of columns of epithelial cells, separated from each other by connective tissue septa. The epithelial cells appear to be arranged in rounded alveoli, but the appearance is simply due to the long tortuous columns of cells being cut across. The cells at the periphery of each column are columnar in shape, but as we trace them towards the centre, we find that they are undergoing mucoid degeneration, so that small spaces are formed. It is by the distension of these spaces that the large cysts are formed. The section of these epithelial columns presents a very close resemblance in structure to an enamel organ, but there is never any formation of enamel. The connective tissue stroma of the tumor is composed of fibrous tissue with a few nucleated cells, and contains but few blood vessels. These tumors are supposed to originate from those portions of the enamel germs which do not in the ordinary process of development become converted into enamel (*paradental epithelium*). We are completely in ignorance as to why these cells should lie dormant for years and then suddenly start into activity, as if they were afflicted with a nightmare and felt compelled to grow into enamel organs of fanciful shapes and extraordinary dimensions.

Clinical Characters.—This disease may occur at any age, but is most commonly seen about the age of twenty. It most often affects the molar region of the mandible; when it affects the maxilla the tumor usually occupies the antrum. It grows very slowly; a tumor the size of an orange may have been growing for ten years. It expands the jaw, sometimes equally in all directions, sometimes the inner and sometimes the outer plate is more bulged than its fellow. The surface of the tumor is rounded and more or less lobulated. To the touch the bulk of the tumor is of bony hardness, but there are usually one or more spots where the growth can be indented by the finger, showing that it is really cystic. Sometimes one or more of the cysts

bursts into the mouth and discharges a dark brown fluid. Some of the teeth belonging to the affected portion of the jaw are very often missing, and those that are present are usually much disturbed in position. The neighboring lymphatic glands are not affected. The disease does not recur locally after complete removal, and dissemination in other parts of the body does not take place. It will be seen therefore that the disease is essentially innocent in nature, as innocent in fact as the ordinary fibro-adenoma of the breast. But this is not always so; sometimes the connective tissue stroma, instead of being purely fibrous, is sarcomatous in nature. In such tumors recurrences *in situ* after removal, and dissemination may take place. It is very doubtful if the epithelial elements of the tumor are ever malignant. Heath records a case in which a typical epithelial ulcer appeared in the situation from which a "cystic sarcoma" had been removed eleven years previously. The facts recorded in reference to this case are very far from sufficient to prove that the original tumor was a malignant one.

Treatment.—The whole growth must be completely removed, but it is not necessary to remove any surrounding healthy tissue. If the growth be not completely removed, the portion left behind will continue to grow, and will in time produce a tumor as large as the original one; this is not recurrence in the sense in which the word is used when speaking of malignant tumors. The operative procedure necessary to remove the growth must be determined in each case by its size and situation. If it be small and accesible from the mouth it is better to operate from within so as to avoid deformity from scarring. An incision must be made through the mucous membrane of the mouth and the growth completely gouged away, so that nothing remains but a cavity with healthy bony walls. The bony walls, if much expanded, may be pressed together, care being taken not to fracture the jaw. If the growth be too large to be dealt with from inside the mouth, it must be exposed through an incision on the face, so planned as to leave the smallest and least noticeable scar. The cavity in the bone is allowed to granulate up, so that the site of the tumor becomes filled with fibrous tissue. The solid portions of the tumor should be examined microscopically, particular attention being directed to the connective tissue stroma between the epithelial

columns. If the connective tissue contains any sarcomatous elements, recurrence of the growth should be feared, but if formed of mature fibrous or fibro-cellular tissue the cure will be permanent. If recurrence takes place, the affected half of the bone should be removed.

Dental Cysts.—Under this name authors have described two conditions which closely resemble each other clinically and in naked-eye appearance, but which differ essentially in their pathology. One is a form of odontome, and the other is of inflammatory origin. As one clinical description will serve for both kinds of cysts, we will describe them together.

Symptoms.—They are met with more frequently in the maxilla than in the mandible, and generally in the neighborhood of the incisor or cuspid teeth. They are usually of small size and come away with the tooth when it is extracted, but sometimes they may attain considerable dimensions, and may cause more or less expansion and absorption of the outer wall of the maxilla, so that the bone crackles when pressed with the finger. Sometimes they may involve the antrum secondarily, by causing absorption of the intervening bone. They are always unilocular, and do not contain any tooth or rudiment of a tooth. The fluid which they contain may be clear yellow or reddish serum, a thick glairy fluid of varying colour, or a semi-purulent fluid. The growth of the cyst is usually slow and painless; one or more teeth in the neighborhood are often carious.

Pathology.—Microscopic examination shows that some of those cysts are lined by a layer of epithelium similar to that of the enamel organ, and that others are destitute of any such lining. The first variety is supposed to be formed from the paradental epithelium. It is therefore closely allied in nature to the epithelial odontome already described, but differs from it in that the cyst is unilocular and is devoid of the solid epithelial columns found in the multilocular tumour. Some authorities think that the paradental epithelium may be started into activity by the irritation of a carious tooth in the immediate vicinity. To distinguish it from the other form of dental cyst this condition might well be termed "unilocular cyst or odontome." The second variety is of inflammatory origin and is always found in connection with a diseased tooth. The inflammation starts in the apical space

in the same way as an alveolar abscess, but the process is extremely chronic and leads not to the formation of pus, but to an accumulation of serous fluid enclosed within a fibrous sac. For this variety of dental cyst the old term "perio steal" may very well be retained.

Treatment.—The treatment of dental cysts is the same as that of follicular odontomes (dentigerous cysts).

Radicular Odontomes.—These arise after the crown of the tooth has been completed and while the roots are still in the process of formation. The tumor consists of dentine and osteo-dentine in varying proportions; when the former tissue preponderates it is called a radicular dentoma; when the latter is in excess, a radicular osteo-dentoma. In Salter's well-known specimen, in section, the outer layer of the tumor is composed of cementum, within which is a layer of dentine incomplete below. The central part is formed of calcified tooth-pulp and contains a confused mass of bone and dentine. Radicular odontomes are rare in man, but are common in other mammals, especially rodents. They are often multiple. They frequently lead to suppuration.

Symptoms.—The symptoms of this and of other varieties of hard odontomes are so misleading that, according to Bland Sutton, up to the present time no case has been correctly diagnosed before the removal of the tumor; most often they have been mistaken for exostosis, for necrosis, or for unerupted teeth. The treatment consists in removing the tumor, scraping out the cavity and allowing it to granulate up.

Cementomes.—When the capsule of a tooth-follicle becomes greatly thickened and ossified, the contained tooth comes to be embedded in, or attached to, a mass of cementum. Cementomata occur most frequently in horses, and may attain a large size, one specimen weighing seventy ounces.

Fibrous Odontomes.—A fibrous odontome consists of a tooth enclosed within a greatly thickened tooth-sac. The latter is so thick that it prevents the tooth from erupting. Fibrous odontomes are commonest in ruminants, especially goats. They are often multiple. According to Bland Sutton, the thickening of the tooth-capsule is due to rickets. They have usually been mistaken for fibrous or myeloid tumors.

Follicular Odontomes (Dentigerous Cysts).—They are more

often met with in the mandible than in the maxilla. The cyst wall is composed of a thickened and expanded dental sac, and usually contains calcareous or osseous matter. The fluid inside the cyst is usually clear and watery, but may be viscid, sanious or gelatinous; sometimes, though rarely, the cyst contains a thick, putty-like material composed of degenerated epithelial cells. Sometimes no trace of a tooth is found inside the cyst, the process of expansion having taken place at so early a period that the dental papilla has become absorbed before it has had time to form any dental structure. The great majority of follicular cysts contain some portion of a tooth. The tooth may be complete and may be free in the cyst, but it is usually implanted in the cyst wall, with its crown projecting into the cavity, the roots being truncated or imperfectly developed. Occasionally the tooth is inverted. Follicular cysts are almost invariably in connection with the permanent teeth, especially the molars. One specimen contained the crown of the second molar tooth, and was removed from the mandible of a boy eleven years old. Occasionally the encysted tooth is a temporary or even a supernumerary one. There is some difference of opinion as to the exact manner in which a dental follicle becomes distended to form a dentigerous cyst. All observers agree that the fluid collects between the tooth and the follicular wall. Broca attributes the presence of this fluid to morbid degeneration of the cells of the enamel organ. Malassez attributes it to hypertrophy of these same epithelial cells. According to Tomes, a small quantity of fluid is normally formed between a tooth and its sac, and is discharged when the tooth is cut; any cause impeding the eruption of the tooth leads to excessive accumulation of this fluid. According to Alberran, this impediment to eruption is most often furnished by a blocked condition of the *iter dentis*.

Symptoms.—Follicular cysts are most frequently seen in the mandibles of young people. They form slowly-growing tumors which expand the plates of the bone, Whilst they are still small and are covered by a thick layer of osseous tissue, they feel solid and may easily be mistaken for solid tumors; but sooner or later the bony wall becomes so attenuated that it can be indented by the finger; they are then easily recognized as cystic swellings. Usually the swelling is more or less hemispherical and projects

from the surface of the jaw, but in some cases the whole body of the bone may be evenly expanded in all directions. An examination of the mouth will often show that there is a permanent tooth missing, but too much reliance must not be placed on this deficiency. The tooth may have been removed or it may be absent as the result of individual peculiarity; on the other hand, the number of teeth in the mouth may be correct and the cyst may contain a supernumerary tooth or one not usually cut until a later age. In many cases a diagnosis is not possible until an exploratory incision has been made. Such incisions should not be made unless the surgeon is prepared to complete the necessary treatment at the same sitting, especially when the cyst is a large one, for the contents are very likely to become septic and give rise to a great deal of trouble. Follicular cysts very rarely suppurate unless they have been interfered with. When these cysts occur in the maxilla they very often project into the antrum, and may be indistinguishable from other cystic swellings in this situation until they have been opened.

Treatment.—The necessary incision can nearly always be made from within the mouth, but in large or awkwardly placed cysts it may be necessary to make the incision from without. The cyst must be freely opened by removing a portion of the cyst wall. The contained tooth and the lining membrane must be removed. The expanded walls may then be squeezed in so as to diminish the size of the cavity. The latter must be filled with an antiseptic dressing which must be renewed every day and the cavity syringed out with a weak antiseptic solution.

Compound Follicular Odontomes.—According to Bland Sutton, this odontome results from sporadic ossification of a thickened follicular wall, and contains a number of small teeth or denticles composed of cementum or dentine, or even cementum, dentine and enamel. The following case recorded by Tellander may be quoted as illustrating this variety of tumour. The patient was a woman aged twenty-seven years. "The right upper first molar, bicuspids, and canine of the permanent set had not erupted, but the spots where these teeth should have been was occupied by a hard, painless enlargement, which the patient had noticed since the age of twelve years. Subsequently this swelling was found to contain minute teeth. There were nine single teeth, each one per-

fect in itself, having a conical root with a conical crown tipped with enamel, also six masses built up of adherent single teeth. The denticles presented the usual characters of supernumerary teeth." (Sutton).

Composite Odontomes.—These tumors consist of a disordered conglomeration of enamel, dentine and cementum, and arise from an abnormal growth of all the elements of a tooth-germ, viz.—enamel-organ, papilla and dental-sac; often two or more tooth-germs are fused indiscriminately. They differ from the compound follicular odontomes in that the various parts of the teeth composing the mass are indistinguishably mixed instead of forming separate denticles. Forget's well-known specimen is usually regarded as an odontome of this kind. It was removed from a man twenty years old, in whose lower jaw it had been growing since he was five years old. It formed a round, smooth, hard tumor occupying nearly the whole of the left side of the mandible; all the teeth behind the first bicuspid were absent. When the portion of jaw was removed, it was seen to be converted into a cavity occupied by a hard oval substance the size of an egg, composed of an irregular mass of enamel, dentine and cementum. The affected tooth germs were supposed to be the last two molars.

The Pacific Stomatological Gazette for November, 1895.

"ELECTRICAL ACTION BETWEEN METAL FILLINGS," by J. L. Asay, M. D., San Jose, Cal.; read before the Stomatological Club of Calif., Oct. 1, 1895. A year or more ago it occurred to me that there could be a telephonic communication induced by the two electrodes consisting, respectively, of gold and amalgam in the presence of moisture by the closing and breaking of the electrical circuit. Repeated tests under various conditions have confirmed this opinion. An electrical current existing between different metals in the same mouth is capable of being demonstrated by a little apparatus which I have had made. It consists of a receiver of the ordinary telephone, with conducting cords of about five feet in length. To the end of each is attached an ordinary excavator with the point tapered and bent at an obtuse angle (the latter for convenience only in reaching a filling). These excavators serving as terminals, one is brought in contact with an amalgam filling, the other with one of gold, when the

sound produced by the current can be distinctly heard through the receiver at the ear.

An illustration of the sound thus produced can be given by connecting the instrument with the poles of a dry cell or battery, when the distinct "click," "click," as the circuit is closed and opened, is plainly audible to any one, even if somewhat hard of hearing. In the demonstration in the mouth, however, the cur rent not being so strong as in a battery or cell, this volume of sound is greatly modified and often requires acuteness to hear it. The insulation of fillings by oxy-phosphates, or other non-conducting materials, still further reduces the current and diminishes the volume of sound, if not being entirely prohibitive of electrical action.

There is a difference of opinion among electricians with whom I have conversed regarding the existence of electrical action between gold and amalgam fillings when the two metals are joined. Some assert that no current can be found under such condition; others, that it is a mere short circuiting of a battery. In the voltaic pile we say there can be no electrical action set up where the plates are in close contact, and that there must be an interval of space between the plates filled with an acidulated fluid in order to induce a circuit. What really does happen when gold is built upon an amalgam filling I am not prepared to assert, owing to this diversity of opinion among those who are more conversant with this science than myself. I would suggest one fact, however, that one or more surfaces of both metals, as usually placed in the mouth, are continually bathed in the oral fluids.

In years past and, also, lately, I have had occasion to make many of these so-called combination fillings, and my experience has been and is, that when I have made a gold filling with all the care and detail possible for myself upon a cervical foundation of amalgam, I have invariably found, in a year or more afterward, the gold roughened and softened at the line of junction with the baser metal, although such margin was absolutely solid and nicely finished at the completion of the filling.

"Surgical Treatment of Ulcerated Teeth," by J. G. Parsons, D. D. S., San Diego, Cal.; read before the Calif. State Ass'n., July, 1895. My experience in the heroic treatment of these

abscesses is firmly convincing of its efficacy and utility, not only as a speedy, but as an almost absolutely exact method of curing the trouble, whenever it occurs within a reasonably accessible portion of the jaw. Where the trouble is in its incipent stage it may be aborted by the drainage system mentioned herein. After treating the tissues with cocaine, hypodermically, incision is made with a sharp bistoury, and the outer plate perforated with a bur. In case there is a fistula which is not accessible to convenient treatment, make a direct lateral tract to the apical space. The opening should be sufficiently large to admit all necessary instruments, and care should be exercised to avoid penetrating the maxillary sinus, when the trouble is in the superior bicuspids and buccal roots of the superior molars, as by so doing the complications of the treatment are increased. After thoroughly washing the diseased parts with a three-per-cent. solution of pyrozone, explore for necrosed bone, more or less of which usually exists. This bone is removed with a spoon-shaped excavator, as well as all irregularities at the root of the tooth due to absorption. A 15 to 50 per cent. solution of aromatic sulphuric acid, the strength to be determined by the necessities of the case, is then injected. The excavation and wound are then packed with antiseptic cotton to keep the tract open. This treatment is continued until all the necrosed bone is dissolved and healthy conditions obtained. It is desirable, as a matter of safety, to continue this treatment even for a few days after normal conditions appear to be restored at the seat of disease, the ordinary period of treatment being two to three weeks, although, if the abscess is treated in the early stages, one or two treatments, after the excavation, are sometimes sufficient where the excellent health of the patient favors speedy recuperation. Better do this than allow the opening to close too rapidly and thus increase possibilities of the recurrence of the abscess, especially in a case where a root supporting a crown or a piece of bridge-work has begun to absorb.

The thorough sterilization of the instruments is a prime necessity to the successful accomplishment of this operation. Flat, wide, inferior jaws increase the difficulty of thus treating an abscess. Gravity is also another obstacle met with. Although the treatment is heroic it can, in most cases, be made almost painless by the use of cocaine, and my belief is that so decidedly

exact and efficacious is this treatment that, if demanded, the dentist would be warranted in using chloroform or ether. The advantages of this treatment are that the element of guess-work is almost entirely eliminated from the operation. Possibilities of boring through the side of a tooth-root, which are present when treating an abscess by an excavation through the tooth itself, are avoided. Discoloration of the tooth—a common trouble in abscess treatment through the tooth—does not occur in the operation suggested. Root-filling may be performed at any time after beginning the operation. And most advantageous of all is the tendency of the heroic treatment to prevent a recurrence. When properly performed, this operation is an almost absolute guarantee against a recurrence of the abscess.

Discussion. *Dr. Younger.* A good many years ago I introduced lactic acid, for the reason that I found it to be a most excellent absorber of lime, and it did not act upon the soft tissues. Sulphuric acid acts alike upon the soft and hard tissues—the healthy as well as the diseased. Lactic acid has this superiority over sulphuric acid, that it does not act upon the soft tissues except to stimulate. I use it not only when I want to dissolve for necrosed bone, but also as a solvent of tartar in pyorrhea. I found that in that operation its effect upon the soft tissue is to stimulate granulations and reunite the gum tissue with the tooth, something that sulphuric acid cannot do. I think in the course of a few years sulphuric acid will pass out of the sphere of the stomatologist.

The Dental Register for November, 1895.

"Dentistry in Brazil," by Thos. B. Mercer, D. D. S., Minneapolis. The climate, an all-important factor to the foreigner, is, of course, distinctly tropical, accompanied by that lavish display of vegetation characteristic of the tropics—becoming in the lowlands a perfect net-work of palms, mosses, grasses, etc., luxuriant beyond description. The summer season, from about December 1st to April, is extremely hot, and as the large cities are all seaport towns (with the exception of Sao Paulo), low and damp, they become veritable incubators for low-fever germs which, to the unacclimated new-comer, are often fatal, but in other seasons it is often pleasant indeed, and until the novelty wears off, is really quite ideal.

The people, a mixture of the Portuguese, African negro and native Indian, are an olive complexioned, rather slight people—the better class are pleasant to meet and quite cordial, but inclined to be hypercritical. Their government is at present a very unstable affair, which is detrimental to money exchange and cripples the country. For admittance to practice dentistry in your own name, an examination in the Portuguese language before the Medical Board of Rio de Janeiro must be taken which, by the way, is very severe, but by being in the employ of or using the name of someone licensed, you are not interfered with.

Practically all of the representative dentists are North Americans, who employ from three to five more, but there are some native practitioners who come to "the States" for their course, then return. Prices being high, the work among these representatives is of a very superior quality and conscientiously done. Their offices are fully equipped with all late appliances, but there are native dentists who are about as numerous as barbers, and who, with few exceptions, maintain about the same degree of dignity. Their outfit would include little more than forceps, amalgam, a spatula and arsenic. They use the latter about as freely as we would dental plaster—from an obtundent in a simple cavity to an exposure. The pulp is never removed, so when pulpitis or an abscess develops it is extracted, or they "save up their money" and apply to a "dentista Americana," whose appointment book usually has a dozen or more cases bearing evidence of the skill (?) of these native operators. Outside of the office the life is hardly as agreeable as most of us would wish, as for the first year you are handicapped by the language, and after you have mastered that after a fashion and feel that you would like to become acquainted and mingle somewhat in the society that is afforded, you are confronted with the fact that, humiliating as it may seem, a dentist holds an inferior position. This also holds good among the British residents. But grant that you gain the dental *entree*, you soon find their ways and what is expected of you so different from what you are accustomed to, that you are pleased to let it alone and return to your dental friends once more, where, with the exception of a dinner or an excursion "up country" now and then, you experience the steady routine of work, eat and sleep.

The Ohio Dental Journal for November, 1895.

"THE USE OF ELECTRICITY IN THE TREATMENT OF HEMORRHAGE," by M. G. Jenison, M. D., D. D. S., Minneapolis, Minn. The usual causes of non-coagulation of the blood, or failure of the blood vessels to contract, are too well known to require elaboration. When a hemorrhage results from the extraction of teeth, the usual trouble does not always appear until after the patient has left the office, the bleeding often at the time being very slight. This is probably due to some compression of the surrounding parts in the removal of the tooth. The bleeding appears some time later with various degrees of persistency and profuseness. If the patient does what is proper and calls for attention, which should be given by the dentist, the trouble is usually easy to relieve. But where this is not done, the result is uncertain, except in one respect, and that is that the dentist is unjustly criticised. The customary remedies consist of astringent washes, applications of tannin, gallic acid, persulfate of iron, etc., and sometimes compresses held firmly in place until the bleeding ceases. But in the treatment of hemorrhage, as in a great many other conditions, you are sure to find exceptions, for there are cases where none of these standard remedies will check the flow of blood. It is in these exceptional cases that I believe electricity can always be relied upon. Apply the positive pole directly to wound, having the metal point of such shape that it will come in contact with as much of the injured surface as possible. Then turn on the current gradually until thorough coagulation, but not cauterization, is produced. By this means I have obtained perfect relief in cases where no effect whatever was produced by the usual remedies, including compressing.

The Dominion Dental Journal for November, 1895.

"CARIES OF JAW FROM IMPACTED WISDOM TOOTH," by R. E. Sparks, Kingston, Ont. E. L——, aged about 27, was admitted to Kingston General Hospital June 12th, 1895. He had a large swelling at the angle of the lower jaw, left side. I was asked by the attending surgeon to see the case. We found a slight discharge from a small opening opposite the angle of the jaw. He could not open the mouth more than a quarter of an inch at the incisors. With a distender we forced the mouth open to about

half an inch. We found teeth good, but wisdom tooth impacted. The history of the case as he gave it to us was, that about March 1st he felt gnawing pains in the region of the angle of the jaw. These became more intense, passing over the side of the head. About the middle of April the jaw swelled and by May 1st was locked. Consulted a dentist, who diagnosed an impacted wisdom tooth, but said he could not extract it until the swelling disappeared. He visited a doctor, who recommended poulticing. This was done for a week, when the swelling "broke" and the muscles relaxed, allowing him to open his mouth pretty freely. Exposure to cold brought on a relapse. Jaw again became swollen and locked. He again consulted his doctor, who at once sent him to the hospital. On June 14th an anæsthetic was administered and an exploratory incision was made from the angle of the jaw forward almost to the facial artery. It was found that caries had attacked the jaw opposite the wisdom tooth. This was thoroughly scraped and washed out. The mouth was pried open and the second and third molars removed; the second merely to admit of the removal of the third. It was found that a channel existed from the socket of the wisdom tooth to the external opening just made. The wound was stitched, leaving a drainage tube in. He was dismissed on July 5th. We saw him on August 31st. Swelling entirely disappeared; mouth opened quite freely; scar very slightly noticeable. Altogether a very satisfactory result.

The Dental Review for November, 1895.

"The Advantages of Electricity in a Dental Practice," by Geo. J. Dennis, M. D., D. D. S., Chicago; read before the Odontographic Society. First is its advantage as a motive force. Applied as it is by means of the various forms of motor at present on the market, it has become the most valuable of all the applications of this force. The motor is rapidly taking the place of the old dental engine with its foot treadle, and bids fair to supplant it entirely. This will not occur altogether until more extensive distribution of electricity from central power stations is brought about. Its use at present is somewhat limited, not because its economy of personal injury is not appreciated, but because the source of power is not always a convenient one; the method of distribution may not be applicable to the needs of the dentist, or

the central station may be lacking altogether. The advantages of electricity applied as a motive force are in a measure evident even to one who has had no personal experience with it, but only one who has had the service of this agent can fully understand or fully appreciate its effectiveness as a pain-, time- and labor- saving device.

In the laboratory the motor is equally efficient. Its reduction of the work of the dentist here is almost marvelous, and it is not necessary to dwell upon an advantage so easily observed. In driving a fan during the summer months, either for the purpose of creating a light draught of air over patient and operator, or for transforming the air and reducing the temperature of an entire suite of rooms, its efficiency cannot be too highly commended.

Converted into heat, by means of resisting materials, a wide field of usefulness is opened up, and one as yet not fully occupied. The electro-cautery, which was one of the earliest applications of this force as a heat producer, for removing hypertrophied tissues and for arresting hæmorrhage about the mouth, was quickly recognized as a valuable adjunct to the dentist's cabinet. The root canal drier came next, and because of its small size and lack of bulk, together with the rapidity of its action in producing the amount of heat necessary for the work, soon became indispensable. A comparatively new instrument, the hot-air syringe, electrically heated at the tip in the manner of the root canal drier, still further increases the usefulness of this agent.

An annealing tray, dispensing with the alcohol or gas flame, may be added to the list. Its advantage consists in the absence of gases usually attendant upon the old methods of heating the gold, by many deemed very injurious. Applied as in the electric furnace, for the fusing of porcelain, the advantage of this method and this force over old methods and forces is overwhelming. The absence of heat outside of the furnace itself, the absence of dirt, the saving of time, the small space occupied, freedom from accidents, greater certainty of perfect results—all these are revolutionizing the methods of this branch of our work.

As a source of light, as a substitute for sunlight on dark and foggy days, its convenience when properly arranged exceeds anything presented to us thus far. Applied within the mouth by means of a one, two or three candle power lamp, its assistance in

the discovery of cavities, in the diagnosis of congested or gangrenous pulps or of diseased tissue, whether of the soft parts or of the bony structures, requires no assertion.

As a therapeutic agent its value is little known as yet. It has been suggested that drugs might be readily decomposed in the pockets, about the necks of teeth affected with pyorrhœa, thus obtaining the medicament in its nascent state. A prominent dentist of this city has employed the galvanic and faradic currents in the treatment of chronic alveolar abscess, with irritation of the alveolar process. Success was reported, at the time, but whether a permanent cure resulted your essayist is not able to state.

"DENTAL PYORRHŒA AND CARE OF THE TEETH," by J. P. Carmichael, D. D. S., Milwaukee, Wis.; read before the Northern Ill. Dental Society. Aside from the pleasing appearance that a well-kept mouth presents, it is the means of securing the healthfulness thereof that we are to consider. Teeth should be kept clean, and if we can persuade people to take proper care of their mouths, we are doing a wholesome service to them and their immediate friends, as well as a kindness to all those who come within conversing distance of their breaths.

With the great advance made in mechanical dentistry, there is no excuse for anyone to lack the means to masticate his food. Where the gums are healthy and the teeth worn or broken off at the margin, the skill reached in mechanical dentistry enables us by crown and bridge-work to build a set of teeth on the old roots which in many cases may be more serviceable than the original teeth, besides presenting a better appearance. But it is of disease of the soft tissues that I am particularly to speak. It is safe to assert that more teeth are lost in consequence of diseases in the tissues about the teeth, than from actual decay of the teeth themselves. There are two principal causes from which disease of the soft tissues arises: First, sheer neglect in allowing tartar and filthy accumulations to remain between and about the teeth, until by the crowding with fermentations and decomposition of these accretions, local disease is set up and the gums recede from their attachment. The delicate membrane surrounding the teeth, and on which they partly depend for nutriment, becomes involved, the teeth loosen and fall out, or from the annoyance they

cause, the patient wishes them removed. We should impress upon the mind of the patient the fact that in most cases of this kind, with proper attention and perseverance these teeth can be saved and will certainly be of more service than artificial ones. I have frequently noted that a large number of middle-aged persons insist on having plate work, because of loosened teeth from the causes above referred to. In the treatment of local disease I instruct my patients not to use tooth-powder of any kind. Liquid applications of some antiseptic is preferable, as the powder gets between the gums and the teeth and, remaining there, prevents the healthy adhesion. I consider the application of pure cold water after each meal excellent treatment for the gums, with thorough brushing as a stimulant, for friction is often necessary to produce healthy action.

Pyorrhœa Alveolaris has received considerable attention from dentists during the last year or two and I wish to impress upon the members of the convention the fact of its contagiousness and its constitutional character. I would here remark that the term pyorrhœa alveolaris is perhaps plain enough to the initiated, but when we make such diagnosis and fire the term at the unfortunate troubled with it, it is well calculated to shock the confiding patient to such an extent as to give him an acute though temporary attack of exophthalmic goitre. The patient in alarm is likely to ask if there is a ghost of a chance for him to live long enough to make his will? He thinks that if he has got pyorrhœa alveolaris and got it in his oral cavity too, with hyperacidity of the oral fluids combined with the "uric acid diathesis," and that it requires a learned "stomatologist" to just hump himself to make the slightest impression on the pathological peculiarities of his case, the jig is up for him, and there is no use of his trying to live another minute. It seems to me that when we find that the membrane covering a tooth or teeth is discharging pus and the case does not yield readily to the local application of the ordinary germ destroyers, we should send the patient to a competent physician. The case is no longer a local trouble; it is a constitutional one manifesting itself locally. The probability is that the patient is not well nourished. The white corpuscles of the blood, the scavengers of the body, are not sufficient in numbers, nor the red ones healthy. In obstinate cases there is probably an inherited

taint of so-called scrofula in the blood as a predisposing factor, and bad digestion and bad assimilation of food as the primary exciting cause. It requires only a lowered vitality, impoverished blood with contagious exposure to set up the disease. The teeth affected feel longer than the others, disagreeable matter is discharging from the gums, which seem to shrink away, the teeth loosen and fall out or may be easily removed with the fingers, although the teeth themselves are sound. My experience leads me to say that we should impress upon the patient the truth that the disease is contagious. Eating and drinking utensils used by one should not be used by another before being thoroughly cleansed, and the practice of kissing also should not be indulged in by those having the disease. If applications of aromatic sulphuric acid or borolyptol brought very thoroughly in contact with every part of the investing membrane does not abate the disease in a week or so, the patient requires constitutional treatment, beginning with the intestinal tract first, and afterward with tonics or antiscorbutic remedies as may be indicated. The uric acid complication, claimed by some as the cause, is a mere coincidence and due to maldigestion. Of course, where we have a gouty or rheumatic inheritance in the patient, the uric acid will nearly always be present, but cannot be regarded as a cause of pyorrhœa alveolaris.

The Dental Cosmos for November, 1895.

"A Case of Persistent Facial Neuralgia Due to Enamel-Nodules," by Louis Ottofy, D. D. S., Chicago. Mr. L. E. M., aged 30, an attorney by profession, suffered from intermittent neuralgia for several years. No improvement was noted either under the care of his physician or his dentist. All of the teeth were carefully examined, suspicious fillings removed, and all cavities filled, without any appreciable reduction of the pain. Finally the superior left third molar, which had a pin-head filling on the occlusal surface, became sore, and all indications warranted the belief that an alveolar abscess was in the course of formation. The filling was removed and an attempt made to encroach upon the pulp. During this procedure it became evident that the pulp was still alive. Having encroached upon it, nothing remained to be done but to devitalize it. This was done, the root-canals were

cleansed and filled (unsatisfactorily to me); the cavity was filled with a plastic. For a brief period the pain did not seem so intense, nor were the paroxysms as frequent; but within three months there was no perceptible difference between the conditions prior and subsequent to the devitalization of the pulp. The period from the first introduction of the small filling upon the occlusal surface, until the time of the extraction of the tooth, extended from December, 1890, to July, 1892. Upon examining the specimen it was found to contain a large enamel-nodule at the intersection of the irregularly-disposed roots, on the surface which in the mouth corresponded with the mesial.

Within a few months after the removal of this tooth similar symptoms appeared on the right side of the face, which until this time had been perfectly free from pain. But the pain was not so frequent, neither was it as intense as on the left side, and the patient did not feel disposed to have anything done with it except its removal, and that not until it was absolutely necessary. In May, 1895, the pain increased in intensity, and the paroxysms in frequency. The right upper third molar was the one suspected, and I suggested an examination of the condition of the roots as far as possible. The soft tissues were laid open on the distal surface of the tooth, and the wound tightly plugged with cotton and iodoform. After several days of repeated application, a portion of the process was cut away with a bur, and the enamel-nodule, situated on the posterior surface, was noticeable. The tooth was extracted June 8, 1895, and an examination of the specimen showed the presence of two nodules; and on that surface which occupied a mesial position in the mouth there was imbedded what seemed to be another tooth.

Since the extraction of this tooth the patient has been perfectly free from pain.

WHAT THE TONGUE INDICATES.—A white tongue denotes a febrile disturbance; a brown, moist tongue—indigestion; a brown, dry tongue—depression, blood poisoning, typhoid fever; a red, moist tongue—inflammatory fever; a red, glazed tongue—general fever, loss of digestion; a tremulous, moist and flabby tongue—feebleness, nervousness; a glazed tongue with blue appearance—tertiary syphilis.—*Medical Age.*

Letters.

LET EACH ONE HAVE HIS SAY.

PHILADELPHIA, Dec. 2, 1895.

DEAR DOCTOR:—Seeing in the Nov. DIGEST the letters from members of the Protective Ass'n., and having read some letters in previous numbers, I think that perhaps it may be quite the thing for each member of the Ass'n. to have his say, and that perhaps I might have mine.

With the D. P. A. I am quite satisfied. The dealings I have had with the D. P. Supply Co. have been perfectly satisfactory in all respects. Regarding the DIGEST—I take nine dental journals, and read as many more as I can get hold of, so may perhaps be permitted to .pass judgment upon it. This I do by enclosing check for next year's subscription, and by assuring you that I have taken and shall take pleasure in recommending it to my professional friends. Yours respectfully,

WM. H. TRUEMAN.

COBLESKILL, N. Y., Dec. 15, 1895.

DEAR DR. CROUSE:—I wish to state that I am greatly pleased with the work of the Protective Ass'n. I joined over three years ago, and since then the Ass'n. has saved me over two hundred dollars. And I am sure it would do as well for all the profession if they would co-operate. In the last six months the Dental Protective Supply Co. has saved me much more than my membership fee. Hence my reason for believing that the dentists ought to become members of the D. P. A, and pull together against the patent men and high prices. My brother practitioners, join the Protective Ass'n. and you will never regret it.

I send herewith my subscription for the '96 DIGEST. I would not like to be without it; it is just the journal for the busy practitioner. Yours truly, HOWARD H. FOX.

NEW YORK, Dec. 14, 1895.

DEAR DR. CROUSE:—I am ashamed of our fraternity, that so many are willing to allow so few to purchase immunity for all—

nothing noble about that. I think you had better assess us. I am not a young man and am doing comparatively little dentistry—certainly infringing no patent claims—but I am one of the brotherhood of dentists, and their interests are mine, and

Yours, J. S. LATIMER.

CHICAGO, Dec. 10, 1895.

DEAR DR. CROUSE:—I am simply disgusted with the two letters published in last DIGEST. Let me give you my experience. Before joining the Association I had paid the Tooth Crown Co. something over $80, and had papers made out for nearly $200, and had written them that I would send it at once. I received circulars in regard to the Protective Ass'n., I joined, and when the Crown Co. wrote asking why I had not sent money as agreed, I told them I had joined the Ass'n. I have never heard from them since, and I have no certificate of membership printed in red ink hanging in my office either. Thankfully yours, F. H. BOWMAN.

SAUK CENTRE, MINN., Dec. 5, 1895.

DEAR DR. CROUSE:—I wish you to know that your unselfish efforts to benefit the dental profession are highly appreciated by me, and I am ashamed that I have not written you to this effect before. I don't know how much longer I would have remained silent had it not been for the unkind letters in the Nov. DIGEST. Words fail to express the contempt I have for the men who can be so ungrateful as to pen such letters, and I think every member of the profession ought to cry "shame!" at the exhibition of such base ingratitude. Both of these fellows evidently joined the D. P. A. from a selfish motive, and now that the Ass'n. has so effectually cut off the patent "blood-suckers" that not even a threatening circular has been issued by them for over five years, these ingrates give way to their selfish natures and kick because they put in their $10 when they might have kept them in their pockets and received the benefits of the movement just the same.

Every dentist in the United States is your beneficiary and you deserve the commendation of every one instead of such insulting letters as these two. I have been a member of the D. P. A. almost since the first, and $10 is all I have been asked to contribute. I consider this amount a mere trifle compared with the benefits re-

ceived from a financial standpoint, to say nothing of the sense of security I have enjoyed, feeling that the Ass'n. protected me from *all unjust claims* of the patent sharks.

You have fought this great evil almost single-handed, and now that you have so well conquered it, surely we, your fellow practitioners, owe you not only praise, but our hearty co-operation in your further efforts to benefit the profession.

Gratefully yours, E. C. RICH.

NEW YORK LETTER.

NEW YORK, Dec. 15, 1895.

To the Editor of the Digest,

MR. EDITOR:—'How to educate the public,' was, we think, well answered in the *New York Herald* not long ago by giving several cuts and an article, both doubtless copied from a dental journal, on correcting deformities of facial expression. The author's name was omitted. Another item told New Yorkers that the tendency of dental practice was down-town in the business centres, adding that the Chicago dentists had centralized in the heart of their city. It is true that there are a few practitioners in the down-town portion of New York, but only a few, and the geographical situation of Manhattan Island precludes the probability of anything like a radical change. There is a decided change taking place as regards the occupation of apartment houses by dentists; many are now domiciled in them, having fitted up some of the finest offices in town.

Dr. Goddard, of California, was at the November meeting of the 1st District Society, and we invited him to witness a novel operation by the veteran Dr. Clowes. We will give a description of it in the near future. The dental department of California is in good luck; $250,000 endowment by the State, and the Mayor of San Francisco has donated enough land for new buildings, together with the University.

Dr. Stowell, of Pittsfield, Mass., edified the November meeting of the 1st District by a paper, "Prevention vs. Cure." Diet was emphasized, but there was something greater than diet—assimilation. We think there is something greater than either, viz.—nor-

mality of the nervous organization. The best we can do with this last is experiment, as we are under limitations.

The meeting of last month was the joint one of the Stomatological of Philadelphia, and the Odontological, introducing to Society, Dr. Darby Jr., son of the honored professor of the University of Penn. The paper was very interesting, the "new thing" about erosion is that uric acid causes it. Dr. Shepard says cleanliness will prevent many cases of pyorrhea alveolaris; Boston does not go it a bit on uric acid. There were twenty-one visitors from Philadelphia; it looked like a red letter night. A marked feature of attraction was the gift of a large selection of choicely made dental instruments. They were donated to the Society by the daughter of the late Dr. Harvey Elliott, and will soon be on exhibition in the cases of the meeting-room.

In the November number of the *Review* we note Dr. Ottofy's paper relative to the spreading qualities of gold under the pressure of round or oval surfaces. We have found that for many simple operations there is too much physical and nervous energy expended, both by the patient and operator. Many simple fillings can be well made with much less work, and this is due to both parties. In the enthusiasm for "our methods" of practice we are sincere, but wisdom and judgment at last come to be the greatest factors in saving teeth in the easiest manner. We wish to emphasize the fact that when we are able to fill with less pain there will not be so much demand for extraction. We are sure that so much machinery is responsible for much of the intense suffering that is needlessly caused; delicacy is overlooked far too much.

A friend has told us of a secret in journalism. He has an acquaintance whose business is the publishing of a popular magazine, and he tells him that he has an income of $40,000 from advertisements alone. We are more strongly impressed by this information than ever that there is a field in dental journalism that has never been cultivated. We are living in an age when every calling should come into touch with this busy world. A combination of subjects is needed; instead of having four subjects treated in four different journals, put them into one and give a variety of literary productions. In our own profession we have pleasing writers on various subjects. Not many years since one of Montreal's practitioners of dentistry gave some exceedingly in-

teresting and artistic articles, well illustrated, for the *Century*; our late Prof. Garretson could have written for a journal of this character; Dr. Johnson, of Chicago, has acquired fame in this line; Dr. Ottofy has talent; Dr. Ottolengui has no little celebrity from his quaint writings. Would that someone could have the courage to proceed on the line of a "Variety Dental Journal," made up of the combinations named and interspersed with articles in plain language on dental subjects, showing by illustrations any and all operations of progress. The interests of value that would be acquired would be beyond calculation. The public would not be compelled to depend upon "Parlor" dental advertisements for so-claimed improvements, but they should know the truth from reputable sources. The independence that a journal of this character could assume, without fear of contradiction, would be beyond anything before attempted. The field of subjects for illustrating is unlimited. Such a journal would find a place among the public along all the lines of travel and would not be excluded as technical. An economical, variety, illustrated journal is a thing of the future. Twenty thousand dentists in this country at ten cents is no small income, to say nothing of the reasonable probability that the public would be an additional income. Behind all this is an income from an immense variety of advertisements needed more or less by the public and the dental practitioners.

Is this possible? Rumor has it that a graduate syndicate of reputable practitioners are to offer an opportunity for the much-gulled public to have "legitimate" dentistry at low rates; these reputable practitioners to be unknown, but to share the "spoils". Low rates for honest work are much needed in all cities and towns. We are not sure but a move could be made in the direction spoken of by employing earnest and promising young practitioners, for too many are caught up by the proprietors in many of these increasing dental parlors. Possibly some of this class of young practitioners could be much encouraged by being put into an office supported by able men (incognito). They too often feel compelled to accept offers of an objectionable kind. The problem of meeting the limited in means by honest service is very sparsely met by dental colleges, if half the reports are true.

We are led to emphasize the editorial in the November DIGEST relative to the letters of adverse criticism—Dr. Crouse has too

many true friends in this vicinity to notice such communications as are found in the November number of the DIGEST. Such men need to take journals that they may be posted in the price-lists of the market, and concerning what is taking place.

There was an interesting time this month in Dr. Phillips' office at a clinic presided over by Dr. Gillette, of Newport, and all about cataphoresis. Perhaps my readers will be curious to know what this cataphoresis is in New York for. Well, it is here to prove that dentistry can be practiced painlessly. Dr. Gillette showed that he took it last April, and he said that it can be done right along in from seven to thirty minutes. The most enthusiastic speaker of the evening was one who had it applied. It took about fifteen minutes, and during that time it felt as if cold air was blowing into the cavity. When enough time had elapsed, Dr. Rhein, being somewhat skeptical, proceeded to excavate vigorously, but it felt simply like cutting a finger-nail and did not hurt at all. Great applause followed. However, simplicity is demanded for practical dealing with sensitive dentine, and in this new wrinkle it is not attained.

A Williamsburg dentist claims great success in the use of 70 per cent. sulphuric acid. We have used it successfully in a large number of cases with a vascular structure, but in the denser it often causes too much pain without lessening the sensitiveness. So far as the cleansing effects of the acid are concerned, by the use of carbonate of soda all its bad effects are eradicated.

We once told an electrician that when the Yankees hurt a finger they pounded it to stop the pain. "That is it," he said, "that is what electricity does." These experiments we have referred to were in connection with cocaine. Is it the cocaine that makes the operation painless? Dr. Phillips says it is a mechanical effect. It looks to us like a molecular activity which is mechanical in its effects.

The question of free service by dental schools is exciting the thought of many, and it is a subject which affects the profession as a whole, for in common with other humanitarian callings, we are all alike in our relations to the poor. Until there is found a solution of the vexed problem, the greater part of gratuitous service will continue to be dispersed by the generous hearted, and in this connection we wish to say that we never met anyone who

was so unselfish in this respect as the late Dr. W. H. Atkinson.

We notice a disposition to criticise the methods of other journals because they seek to entertain by gossip, etc. The author of these remarks should remember that variety is the spice of life—all do not like the same kind of reading, and some may enjoy a letter.

Dr. Johnson's method of placing proximal fillings in incisors, as shown in the *Review*, is good and we heartily commend it, having successfully practiced it for many years, using convex-faced, smooth fillers and heavy gold. Yours, M. A. G.

FEAR IN CHLOROFORM NARCOSIS.—I am inclined to put down fear as one of the most determinate causes of fatality from chloroform. I know of several instances in which it was impossible that chloroform, *minus* fear, could have been the direct cause of death, because sufficient of it was not administered to produce death.—*Richardson.*

DROPS.—Dr. Eder, in the following, gives the number of drops required to make a cubic centimeter, showing the variations in the size of drops of different liquids: Water, 20; Hydrochloric acid, 20; Nitric acid, 27; Sulphuric acid, 28; Acetic acid, 38; Castor oil, 44; Olive oil, 47; Oil of turpentine, 55; Alcohol, 62; Ether, 83.—*Scientific American.*

GUAIACOL AS A LOCAL ANÆSTHETIC.—The value of guaiacol as a local anæsthetic has recently been brought under notice by Dr. Lucas-Championniere, in a paper read before the Academy of Medicine in Paris. The anæthetic properties of guaiacol seem to have been first noticed by Andre, a pharmacist of Paris. The guaiacol was used in solution in olive oil, in the proportion of 1 in 10 and 1 in 20, a syringeful of the former strength containing 10, and the latter 5 centigrams of guaiacol. The injections were first tried for the extraction of teeth, and with the result that perfect analgesia was produced, while the sensation of contact and movement was left. Dr. Lucas-Championniere himself tried the method principally for other minor operations, with equally successful results. From the account given guaiacol would appear to be as powerful as cocaine and is not followed by any unpleasant effects. The full effect does not manifest itself until five minutes after the injection, and in most cases it seems best to allow seven or eight to lapse before operating.—*Jour. of Brit. Dent. Ass'n.*

The Dental Digest.

PUBLISHED THE

TWENTIETH DAY OF EVERY MONTH.

Editorial.

OUR FIRST YEAR'S WORK.

With this issue we close the first volume of the DIGEST. Starting with the plan of conducting a journal which should be different from any other, it has taken some time to simplify and arrange the work, as furnishing the digested thought of important articles has, we believe, never before been attempted in dental journalism. We are well aware that there is still much room for improvement, but we expect to greatly better this feature as we proceed, and to make the journal truly one in which the dentists can find everything of importance and interest published which is of any use to them, thus effecting a great saving of time and money.

This journal is untrammeled by any trust or combination, lawful or otherwise, and is influenced by nothing except the wish to serve the best interests of the dental profession. As the Protective Association stands for the freedom of the dentists, so this journal, its organ, stands for freedom of expression, and its pages are open for the free and dignified discussion of any topic of general interest to the profession.

No part of our revenue is derived from any advertisements of any dental trust, as we presume, similar to its rules of trading, no one in such combination would be allowed to advertise with us. Therefore, the support of the journal, both intellectually and financially, must come from the dentists and their friends, not from their enemies. From the help we have already received we are encouraged to redouble our efforts. Thanking our friends for their past favors and bespeaking a continuance of the same, we close our first volume with best wishes for the New Year.

THE WORK OF THE DENTAL PROTECTIVE ASSOCIATION.

We publish in this issue the commencement of a series of articles on the history of the Protective Association and litigation connected therewith, with a view of showing the members and the profession generally what has been accomplished, hoping thereby to interest them in the work yet before us.

As the success of the Association is no longer an experiment, we see no reason why the profession at large do not all unite with it—we say, no longer an experiment, the facts of the situation prove the proposition. The Association has been in active operation for eight years, during which time it has absolutely stopped all annoyance to the profession from patent claimants, has saved the profession, it is safe to say, at a low estimate, $5,000,000, and those joining it have paid only the membership fee, ten dollars, as there have been no annual dues, so that the average cost per year has been but one dollar and twenty-five cents, which is less than the annual dues of dental societies. What we want now is a complete banding of the profession into this organization. The saving of money and annoyance is only a part of the good of the Association is doing. The banding of the dentists into an organization where there are no politics and no strife and everything is harmonious, is of inestimable value in the way of increasing the fellowship and co-labor which are so much needed now in the dental profession.

To disband the organization at this time would throw the whole dental profession into trouble and annoyance as deep as ever, for we being without an organization, those scheming to secure our earnings would have nothing to check them, and no individual member can afford to resist even the flimsiest of patent claims. There are numerous patents on various methods and appliances now in use by the profession, the claims of which have never been urged, simply because the Protective Association stands as a barrier to such claims.

We feel sure that if those outside of the Association fully understood the situation, nearly all would unite with us, and it would require very little effort to accomplish this end.

Each member has had sent him a list of those in his state who are members, and if they will take some concerted action and

divide up the territory, the perfecting of the organization, by getting the respectable practitioners into our ranks through personal solicitation, will soon be accomplished. As the permanency of the present organization depends upon this increase, may we not hope that this effort will be made.

MORE THOROUGHNESS.

Under the head of "A Blot on the Profession," we publish in this issue an article from the pen of the well known teacher and practitioner, Dr. Geo. H. Cushing. This article is a well-timed plea for more attention to and thoroughness in the operation of removing the deposits from the necks of the teeth. The cases he cites of neglect on the part of reputable practitioners could be greatly increased if the observation of others were given. We could certainly tell of numerous instances wherein the operators had neglected this important duty. The reason why this operation is so often neglected we should say comes in part, at least, from the fact that there is no fascination in performing it. Another weighty reason is the lack of appreciation of the importance of the operation, and of the skill required to successfully perform it. We know that in the offices of some skilled dentists this task is almost invariably turned over to the office-girl, although she is not supposed to know anything about dentistry. This is further proof that the skill required is not appreciated. But the main reasons are probably carelessness, indifference, and a lack of disposition to perform an uninteresting and, we will add, very difficult operation, as removal of the sanguinary deposits from some positions on the teeth is very difficult, if it can be done at all in extreme cases. Whatever the cause for the neglect may be, it is a great wrong to the patient and is more than ordinary carelessness.

EAR-WAX.—To dislodge hard Impacted Wax from the ear, Dr. Dundas Grant recommends a solution of bicarbonate of sodium, fifteen grains, three drachms of glycerine, and distilled water sufficient to make an ounce; to be dropped into the ear, warm, followed by persistent syringing.

A HISTORY OF THE WORK THUS FAR ACCOMPLISHED BY THE DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

It is my intention, in this and following numbers of the DIGEST, to give a history, brief as possible, of the organization and work accomplished by the Dental Protective Association, including history of suits.

By way of showing the necessity of organization, I will briefly describe the conditions surrounding us and the schemes for getting our earnings. After the expiration of the Cumming's patent, which was on the application of vulcanite rubber to dental purposes, and was so successfully enforced that the dental profession paid royalty on it for the lifetime of the patent, another corporation was formed and known as the International Tooth Crown Company. The promoters of this Company, seeing the favorable condition of the dental profession, they having been trained by the Rubber Company to pay royalty, and with the skill and experience which comes from long practice, were able to organize just the kind of a company to best secure the object desired and make the dentists do their bidding.

This organization soon began giving the dentists the greatest annoyance possible. They had taken out and acquired patents —numbering from thirty-five to fifty—which covered all manner of operations and devices, making it impossible to practice dentistry without infringing many of their patented claims. And having in their employ the attorneys and former agents of the old Goodyear Dental Vulcanite Company, they were fully equipped to again yoke the dental profession and make them pay royalty in much greater amounts and by much more disgraceful methods than were practiced by the old Rubber Company. They had commenced issuing licenses and bringing suits as early as 1886; already had a number of dentists under injunction, and E. S. Gaylord, of Connecticut, was fighting their claims single-handed until an able committee of New York dentists, of which A. L. Northrup was chairman, took up the fight.

This committee, by appealing to members of the profession and dental societies, secured funds and came to the aid of those who

were being sued by the Crown Co., and after a vigorous effort on their part the suits were argued and the Crown Co. was defeated in their claims on the Richmond Crown, and various patents on methods of cutting off crowns, driving out pulp with wooden peg without pain, and preparing root for crown and filling end of root. The company succeeded, however, in having the Low Bridge patent sustained, but, as I understand it, the committee had not considered this patent of much importance, nor did they have much time nor the advantages of organization through which to collect testimony, and on this account the Low Bridge patent had a decision in its favor, and this decision went so far as to declare all other bridge patents an infringement of the Low. The Crown Co. appealed from the decision of the lower courts on the Richmond Crown patent and carried it to the Supreme Court of the United States.

The expense of this litigation had more than exhausted the money raised by the committee; the profession had become demoralized, and the fight in this way had to be abandoned. In the meantime the Crown Co. were taking advantage of the situation and were on a vigorous campaign for licensees. With the Low Bridge patent sustained, those appealed in which they were defeated, and owning several patents on various crowns and methods of crowning, also patents on articulating bites, methods and materials for filling roots—the license contract showing thirty-eight patents—fully equipped and unmolested, they were making rapid progress in securing licensees in all parts of the country. The following is a copy of the license contract which the profession were compelled to sign or abandon practice:—

INTERNATIONAL TOOTH CROWN COMPANY.

LICENSE AND AGREEMENT.

WHEREAS, International Tooth Crown Company, a Corporation organized pursuant to the Laws of the State of New York, is the owner of certain Letters Patent heretofore granted, for inventions and improvements in Artificial Dentures or Dental Processes, including the following, to wit:

United States Letters Patent, No. 144,182, dated November 4, 1873; No. 238,940. dated March 15, 1881; No. 245.782, dated August 16, 1881; No. 224,355, dated February 10, 1880; Nos. 277,934, 277,933, 277,935, 277,936, 277,937, 277,938, 277,939, 277,940, 277,941, 277,942, 277,943, all dated May 22, 1883; No.

282,119, dated July 31, 1883; Nos. 318,581, 318,579 and 318,580, dated May 26, 1885; No. 330,431, dated November 17, 1885; Nos. 352,784 and 352,785, dated November 16, 1886; Nos. 354,356 and 354,357, dated December 14, 1886; and No. 357,044, dated February 1, 1887; and whereas said Company may hereafter become owner of other Letters Patent relating to similar subjects hereafter to be granted or acquired; and whereas, although in the Circuit Court of the United States two of said Letters Patent, to wit, said Nos. 277,941 and 277,943, have been held to be invalid, and said Company's Bill in Equity to restrain infringement of same has been dismissed in consequence; but said Company is, notwithstanding dissatisfied with such holding and dismissal, and has duly perfected its appeal to the Supreme Court of the United States therefrom and from the decree entered in consequence, and said appeal is now pending in said Supreme Court in the case of said Company, appellant, vs. Edward S. Gaylard, et. al., respondents, and said Company proposes on such appeal to establish thereupon the validity of said Letters Patent Nos. 277,941 and 277,943, notwithstanding the decree of said Circuit Court, and whereas ..... of ..... County of ..... and State of ..... in view of all the premises is nevertheless desirous of acquiring from said Company the right or privilege of using any and all the said inventions and improvements in Artificial Dentures, according to the specifications of the Letters Patent above described; it being stipulated and agreed by the said ..... that he will not at any time contest the validity of said Letters Patent nor any of them, nor his infringement thereof. Now, therefore, this agreement made between the International Tooth Crown Company, party of the first part, and the said ..... party of the second part, witnesseth that the said International Tooth Crown Company, for and in consideration of the sum of ..... dollars, and of the payment of the royalty hereinafter agreed to be paid, and the faithful performance by the party of the second part of the conditions herein specified, doth hereby grant unto the party of the second part a right or privilege, under said patents, to use the said inventions for the production of Artificial Dentures in his own business as dentist, and for his own patients only, and for no other purpose, and to vend the Artificial Dentures so produced to his own patients only within the said ..... of ..... and not elsewhere, during the time for which this right is granted, upon the following conditions, viz.: The said party of the second part shall keep full, true and accurate books of account of every operation in dentistry in which any said dentures, including "Crowns" or "Bridges," so-called, are set upon or attached to roots or teeth in the mouth, and of every operation or every piece of work substantially like those patented to, or patents covering which are owned by, the International Tooth Crown Company; and that he will enter or cause to be entered in said book the name of the patient, the date of the operation, the gross sum charged for said operation, and the gross sum received for said operation, and that he will on the first days of January, April, July and October of each year, make to the party of the first part a full, true and accurate statement, in writing, in the form prescribed by the party of first part, and under oath if desired, of all the sum or sums of money so charged or received by him for any such operation or

piece of work aforesaid during the three months last preceding such statement, and that he will at the same time that he makes said statement, and as roalty for the use of all inventions and improvements purporting to be secured by said Letters Patent, as well as royalty for the use of any of them, pay to the party of the first part ..... per cent. of all the gross sum or sums of money so charged by him. Said party of the second part further agrees that said books of account shall be open at all reasonable times to the inspection of the authorized agent of the party of the first part; that the said privilege shall not be assigned, sold, transferred, or otherwise disposed of in any manner. That the party of the second part shall not by himself, his agents or servants, directly or indirectly, use or practice said invention, or vend said dentures for or to other dentists, nor in any way except in his own business and for his own patients. And the said party of the second part agrees that in case he shall advertise said process or operations or dentures hereinbefore referred to, either in any publication, or by notice or circular, or otherwise, he will not in said advertisement, notices, or circulars, make any reference to or state directly or indirectly the price which he expects to receive for such work or his charges therefor. The said party of the second part further agrees that he will in no case nor under any circumstances apply to a root or make for a patient a tooth crown like those patented or hereafter patented to the party of the first part, or a series of tooth crowns, or bridges containing tooth crowns or artificial dentures, at a less price than ten dollars for each crown or tooth so applied, and that he will in no manner countenance or encourage infringements on the Letters Patent or inventions above described or any of them, but shall at all times recognize the validity of said patents. And it is further agreed that the party of the second part shall not knowingly admit as a partner or employee in his business as a dentist, directly or indirectly, any person or persons who stand enjoined from the use and practice of said inventions by the decree of any competent court; nor shall anything in this right contained be any protection or defense to the person or persons so enjoined. And the party of the second part, for and in consideration of the privileges herein granted, hereby covenants and agrees to hold the within granted rights and privileges, subject to the terms and conditions herein specified, and in case of failure on his part to comply with all or any of them, then this right shall be terminable at the election of the party of the first part, and upon a written or printed notice thereof served upon the party of the second part, or published in a paper having circulation in the county where the party of the second part resides, or is doing business.

And it is further agreed that this right shall commence as of the ..... day of.....188 , and shall continue in force until the first day of ...., 188 , unless revoked by the party of the first part on account of violations of its provisions by the party of the second part, but such revocation shall not release or discharge the party of the second part from his covenants or from any amount due from him.

It is further covenanted and agreed by the party of the second part that upon expiration of this right, whether by his own breach of covenants herein, or by lapse of time, he will keep and observe every covenant, agreement or

stipulation herein in regard to the validity of said Letters Patent and all of them and the title thereto.

For the true and faithful performance of every covenant herein contained the said..... for himself, his heirs, executors administrators and assigns, does bind each and every one of them unto the said party of the first part, and its successors and assigns in the sum of twenty-five hundred dollars of lawful money of the United States liquidated and agreed damages. The party of the second part further covenants and agrees that in case of his violation of any of the clauses of this agreement and upon notice served upon him as provided in this agreement the party of the first part may apply for and obtain from a suitable court an injunction under said Letters Patent or any of them, hereinbefore set forth, restraining the party of the second part from any infringement of said Letters Patent; and this agreement is to be taken as a consent that such injunction may forthwith issue, and the party of the second part agrees that he will not oppose the issuing of an injunction when applied for, as hereinbefore set forth. The International Tooth Crown Company, for and in consideration of the faithful performance of the covenants and agreements hereinbefore contained, agrees that it will speed said appeal as much as possible and will protect the rights of the party of the second part herein so far as it may be reasonably able, and that it will endeavor so far as possible to establish a monopoly under the Letters Patent hereinbefore set forth on any of them.

In witness whereof, the party of the second part has hereunto set his hand and seal; and the said International Tooth Crown Company, by their Attorney in fact who is duly authorized in this behalf, hath caused its name to be subscribed and its corporate seal to be affixed the .....day of..... 188 . INTERNATIONAL TOOTH CROWN COMPANY.

One of the various methods they adopted was to get clinicians appointed at society meetings to instruct and work up an interest in methods on which they held patents, also to employ instructors to go amongst the dentists and teach their patented methods. Then their agent following had more definite knowledge as to who to approach as infringers. After securing as many licensees as possible in a town, the agent would, by way of reward to the victims, insert this notice in the local papers:—

DENTAL NOTICE.

This is to certify that.....Office No.....street, is our only licensee, to make and to furnish to patients in the city of ..... any tooth crowns or bridge work, so-called manufactured under the patents of the International Tooth Crown Company. Said patents are construed to cover the most practical forms of artificial dentures now commonly known as Crown and Bridge-work.

All persons are hereby cautioned against obtaining any such artificial dentures from any dentist not licensed, as none are authorized except by the written license of said company.

The full legal penalty will be promptly enforced against all dentists, as well as their patients, making unauthorized use of any such patented denture.

A reward will be paid by said Company to persons furnishing it with any cases of bridge-work of one, two or more crowns or bridges made by any dentist not licensed by this Company.

INTERNATIONAL TOOTH CROWN CO.

By JACKSON W. ALWARD, General Manager.

Dated.....,188 .....St.

Then by way of further enforcing their schemes, suits were commenced against several of the prominent men in different cities, so before the Protective Association was organized a large number of suits had been begun. Nor was this all, as five or six other companies had been formed with numerous patents on various methods of practice, details of which I will treat of later. Suffice it to say that it appeared to me as if our peace, manhood and prosperity were threatened on all sides.

After much thought and planning the Dental Protective Association was adopted and first presented to the profession at a meeting of the Odontographic Society of Philadelphia, in December, 1888.

It must be remembered in this connection that the unsuccessful attempts in former years to get united action on the part of the profession made it much more difficult to form this Association, and the lack of encouragement by the profession, and the urgent advice given me by leading minds to abandon the scheme, would have discouraged a less hopeful projector.

The one prominent thought that kept me from relenting was that a profession with any manhood could not be thus longer imposed upon, and that the idea of 18,000 dentists submitting to the humiliation and hardship of signing licenses, such as here printed, and paying royalty to a half-dozen patent companies on upwards of one hundred patent claims, none of which were worth the paper they were written upon, if properly tested, must eventually cause every dentist in the land to send the ten dollar membership fee and unite with the Association, and that surely they would as soon as the situation was understood, confidence in the plan adopted and faith in the integrity and ability of the promoters secured.

The first three months I did not succeed in getting a sufficient number to join to pay one-third of the retainer to the attorneys, whom I felt sure we must have in preference to any others, owing

to their knowledge of the workings of our patent litigation with the Rubber Company, and besides I knew they possessed superior ability as patent lawyers. Therefore, I paid the retainer, $500, out of my own bank account. It was quite important also that we should file answers and checkmate the legal steps taken against numerous members of the profession in different parts of the United States, therefore it would not have been wise to wait until we had a big list of members. Consequently, I took control and commenced filing answers where members were sued, and before I had sent out more than two or three circulars, say two months after the work of organizing and defending was started, I had stopped these companies from securing licensees, which fact soon caused them to stop active canvassing. Even with this improved condition it was many months before I had any considerable number to unite with us. It required the sending out of circular after circular to the profession, visiting many societies, and making personal appeals, besides much personal solicitation before we reached five hundred members. After each circular I would hope, knowing the good the Association was doing, that this time we would have a more liberal response than ever before.

During all this time I was hunting testimony, looking up witnesses and taking care of numerous suits that were being brought against members in all parts of the country. A history of these suits will follow in other numbers of this journal. J. N. CROUSE.

(TO BE CONTINUED.)

News Summary.

TO REMOVE BLOOD STAINS.—The *Zentralblatt f. Gyn.* states that the best way to remove blood-stains from towels, etc., is to soak these in warm water to which a teaspoonful of tartaric acid has been added. No soap is needed.

TEST FOR INSANE PERSONS.—Buston Ward, the celebrated English physician, says: "There is one infallible symptom indicating whether a person is sane or not. Let a person speak ever so rationally and act ever so sedately, if his or her thumbs remain inactive there is no doubt of his or her insanity. Lunatics seldom make use of their thumbs when writing, drawing, or saluting."

CAMPHOR FIENDS.—The recent discovery, on the streets of St. Louis, of a woman unconscious from the effects of an over-indulgence in camphor, has brought to light the fact that the habit, while a strange one, is by no means a rarity; a number of druggists and physicians testify to this. Camphor-eating is not so pronounced an evil as the excessive use of some other drugs, but it is nevertheless an existent evil.—*North American Medical Review.*

COPPER POINTS.—C. D. Hand recommends the use of copper points, made from wire, such as are used for electric bells, thus: Fill the apex of root with chloro-percha. Moisten a gutta-percha point in chloroform and press down. Heat the copper point and drive home. If the proper length is first taken and the larger end flattened slightly, it is a support for alloy which will adhere closely to the copper that cannot be excelled. Employing first the gutta-percha point prevents any discoloration of the tooth.

EMPYEMA OF FRONTAL SINUS.—It is not easy to diagnose an empyema of the frontal sinus attended with a bulging backward and downward of the orbital plate. Catheterism through the nares is most practicable, but this maneuvre is extremely difficult in the normal state, though simple and effective when the sinus is distended. Amaurosis and amblyopia are present in certain cases when the pus takes a backward direction and presses on the optic nerve as it enters the orbit. Pain is constant, the visual field is narrowed, and the disturbances of all the ocular functions are extreme. In all these cases one should first endeavor to drain through the nose, but if this fails, resort must be had to the trephine, though this leaves a scar.—*G. Martin, in Annales de Medicine.*

A VALUABLE TOOTH-PASTE.—No doubt our sailors need all the attention paid to their teeth which is possible, and here is an advertisement in Japanese-English which was widely circulated in English ships: "In the East there was no good sanitary tooth-paste was sure to cure and safe to use, so our company resolved to prepare a good natured paste and successed. The efficiencies of this paste are as following: Firstly, to strengthen and preserve the nature of the tooth: Secondly, to tight the tooth with thingams: Thirdly, to defend a hemorhage arisen by frictrir: Fourthly, to take away the offensive smell of the mouth: Fifthly, to difent the putrifaction of tooth and so prevent the carious one. Any one who uses this paste will certainly discover that it is of a very wonderful and valuable nature, by his practice. To use this paste, it is necessary to vinse the mouth with walir aftr sabling the tooth carefully by the tooth brash." A good-natured paste which has successed ought certainly to tight the tooth with thingams, if not with thingambobs, and to prevent the carious one; but how is it, however good-natured, to defend a hæmmorhage, however arisen? And how is the tooth sabled? Oh, mysteries of English as she is wrote!—*British Journal of Dental Science.*

LACTIC ACID IN EPITHELIOMA OF FACE.—In November last I was called to see a patient, aged 65 years, who for five or six years had a sore situated on the cheek, and that within three months had begun to develop very rapidly. Prior to this it had gone through the usual characteristics of a slow-growing epithelioma. The ulcer was unusually thickened and indurated, about the size of a silver dollar, fully two-thirds of the surface occupied by an elevated, indurated, thickened, characteristic wall. Remembering Von Mosetig' Moorhof's declaration that Lactic Acid has the power of attacking and destroying cancerous growths without injuring healthy tissues, I concluded to resort to this agent, and accordingly had it prepared in the form of a paste along with silicic acid, and of a strength of about fifty or sixty per cent. Patient suffered very little pain from this; indeed, at no time was the suffering very acute. At the end of a week the strength of the paste was increased, and the application continued every day. Soon the surface of the sore began to granulate; the walls broke down like magic; and when the patient was discharged in the succeeding January, there remained only a perfectly clean cicatrix, smooth and somewhat reddish, about the size of a penny. Note that in six or seven weeks from the first application the man was entirely well.—Doctor I. M. BLOOM, in *Journal of Cutaneous and Genito-Urinary Diseases.*

ITCHING OF THE MOUTH.—Tommasoli relates the case of a peasant woman, 33 years old, without anything remarkable in her history, who for four years had suffered with an itching and biting sensation in the cavity of the mouth, which compelled her to bite her tongue and to compress the mucous membrane of the cheeks between her teeth. The affection was aggravated in paroxysms, and occasionally she was entirely free from it. The chief situation of the abnormal sensation was in the tongue, which often bled from severe bites. Examination of the cavity of the mouth showed on the mucous membrane of the cheek two whitish, almost horizontal and symmetrical stripes, which were nearly as long as the alveolar processes, to which they corresponded roughly in their course and of which a slight impression was to be seen. Beginning at the last molars, these stripes reached almost to the angles of the mouth. The epithelium on these stripes was moist and soft, but not apparently destroyed. The whole looked like a linear zone of œdematous swollen mucous membrane. Yet, on palpitation, the stripes felt like cords, indolent and not yielding in the slightest to digital compression. All the rest of the mucous membrane, as well as the tongue, appeared sound. The author believes that this was a chronic paroxysmal paræsthesia of the buccal mucous membrane, giving rise to actual changes in those parts of the mucous membrane that were most affected. He gives the name preitus to this affection.—*Deutsch Medizinal-Zeitung.*

INTOXICATING BEVERAGES REPLACED BY TEA AND COFFEE.—Medical men, as well as the people in general, are becoming more and more convinced of the baneful influence of excessive alcoholic indulgence. The former by exact

scientific observations and the latter by experiences in life. Both, therefore, have learned from experience; and it is a sign of the times, a significant fact, that in England, a country in which the consumption of alcoholic beverages is as great, if not greater, than that of any civilized country, a steady decrease in the consumption of beer and spirits has taken place since 1876 These stimulants having principally been replaced by tea and coffee.

A record of the consumption, from 1861 up to the present time, of tea, coffee, cocoa and chicory, of alcoholic beverage and of tobacco, compared with the increase of population is of much interest. The most striking feature in the purely diagrammatical return, which has been recently issued and which has been ordered by the House of Commons to be printed, is, according to the *London Lancet*, that while an enormous increase in the consumption of tea, coffee, etc., has taken place—the line illustrating this extending as a diagonal across the diagram till it reaches the top right-hand corner (1893)—there has been a steady diminution in the consumption of both beer and spirits, the lines indicating the last two being practically parallels, not only with one another, but approximately with the base of the diagram also. Between 1861 and 1862 the total consumption of tea, etc., was 120,000,000 pounds; it then steadily rose until in 1893 it stood at 265,000,000 pounds. In the same period the population increased from 28,500,000 to 38,500,000, so that, while in 1861 the consumption of tea, etc., per head was 4.38 pounds, in 1893 it was 6.90 pounds. In regard to wines and spirits, the consumption in 1861 was equal to 35,000,000 gallons, with the population at 28,5000, and in 1893, with the population at 38,500,000, the consumption was 52,000,000 gallons, so that per head, it was equal to 1.22 gallons in 1851 and in 1893 to 1.35 gallons, the highest record being 1.80 gallons in 1876, since which the consumption has steadily diminished.

The consumption of beer exhibits a similar rise and fall. Thus, in 1861, the amount consumed per head was 24.3 gallons, in 1874, 34 gallons, and in 1893, 29.6 gallons, the total consumption varying from 20,000,000 gallons in 1861 to 31,000,000 gallons in 1876, and 32,000,000 in 1893, the population having increased 10,000,000. Coming to tobacco, in 1861, when the duty was 3s 1.8d per pound, the total consumption was 34,000,000 pounds, being equal to the use per head of 19¾ ounces; in 1863 the duty on cigars was reduced from 9s 5.4d to 5s per pound, and the consumption then rose to 21½ ounces in 1865, to 23 ounces in 1877. In the following year—1878—an increase of 4d per pound on all tobacco was made and an extra 2d per pound on cigars in 1879, with the result that after that date the consumption fell to 22½ ounces. From this time it gradually recovered, till 1887, when the duty on tobacco being reduced 4d per pound and on cigars 6d per pound, the consumption quickly rose till it attained to 26 ounces per head of the population in 1893. The total consumption in 1893 was 62,000,000, while in 1861 it was 34,000,000 pounds—*i. e.*, an increase of 28,000,000 pounds for increase in the population of 10,000,000. To sum up, this interesting return shows that there is a decided diminution in the demand for intoxicating stimulants, while there is a very considerable increase in the demand for non-intoxicating stimulants, principally tea and coffee.—*Medical Review.*

Notices.

AN OMISSION.—In preparing the lists of members of the Dental Protective Association, the name of Dr. W. H. Neall, 1617 Arch St., Philadelphia, was o mitted from the Pennsylvania list.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

The annual election of officers of this society, held Dec. 9, 1895, resulted as follows: President, Dr. C. E. Merhoff; vice-pres., Dr. E. R. Carpenter; sec'y., Dr. H. H. Wilson; treas., Dr. Edmund Noyes. Board of Directors, Drs. R. B. Tuller, C. E. Bentley, and J. G. Reid. Board of Censors, Drs. A. B. Allen, H. A. Drake, and G. W. Schwartz.

UNION CONVENTION OF WESTERN PENNSYLVANIA.

A union convention of all the dental associations of Western Pennsylvania will be held in Pittsburg, Pa., Jan. 21–23, 1896. Many of the prominent men of the profession have promised to be in attendance. A large exhibit of electrical appliances is expected. A cordial invitation to be present and take part in the meeting is extended to all dentists. Drs. J. A. Libbey, H. W. Arthur, O. L. Hertig, Geo. R. Shidle, M. George, J. G. Templeton, Committee.

Obituary.

RESOLUTIONS ADOPTED BY THE HARVARD ODONTOLOGICAL SOCIETY ON THE DEATH OF DR. THOMAS H. CHANDLER.

In the death of Thomas H. Chandler, A. M., D. M. D., the Harvard Odontological Society recognizes the loss to the dental profession of a man of rare attainments, and to the city of Boston of one of her most honored and respected citizens.

This Society, bearing in mind with grateful appreciation his long years of untiring devotion and service to the interests of the School, and the imprint upon the calling of dentistry which such a life as his must always leave behind it, desires to place upon record the following resolutions:

Resolved, That in the death of Dr. Chandler the members of this society recognize individually that they have lost not only an esteemed brother dentist, but a warm personal friend as well. That to his family we extend our most sincere and heartfelt sympathy. That a page of our records be set aside in honor and affection to his memory.

EDWIN C. BLAISDELL,
CHARLES H. TAFT,
WILLIAM H. POTTER,
Committee.

BOSTON, Nov. 21, 1895.

"NO. 1" HANDPIECE

Patented Feb. 5, '95.

Designed and Manufactured by

The Dental Protective Supply Co.

A glance at the accompanying cuts illustrating this Hand piece will demonstrate the simplicity of its mechanism.

We have endeavored to design and place before the profession the most simple and durable Handpiece made.

The special features of the Handpiece are the double end chuck, the improved locking device, and long and efficient bearings.

Ample provision has been made for taking up all wear, and we guarantee that if the bearing surfaces are kept clean and well oiled, that this Handpiece will last for years, and prove the best that has ever been placed upon the market.

It is adapted to hold different forms of bit shanks (except cone journal) which can be inserted or taken out from the Handpiece while the engine is in motion; it is also designed so that it can be attached to any Dental Engine, and will fit all ordinary right angle attachments.

Owing to the entire absence of screws the Handpiece can be taken apart without the use of wrench or screw-driver, and is so constructed that escape of oil upon the hand of the operator,—an objectionable feature in some handpieces—is entirely avoided.

In ordering our No. 1 Handpiece, it is essential that you give all necessary particulars as to the style of your engine and attachments

PRICE - - - - $10.00.

—ORDER DIRECT FROM—

THE DENTAL PROTECTIVE SUPPLY CO.

CHICAGO, ILL.

"NO. 1" HANDPIECE.

DIRECTIONS FOR USE.

To Fasten Bit in Handpiece.

Push the sleeve H forward (which opens the split chuck) insert the Bit in spindle and draw back the sleeve H as far as it will go.

To Oil Handpiece.

Unscrew the milled nut A (giving it about 4 turns), take out B, and then remove the sheath. Lubricate at back bearing L, and at coned portion of spindle for forward bearing and also on sliding collar C. Screw sheath back on collar replace B in its seat on H (being very careful to see that the small lug on B engages in the groove of C), and screw milled nut A back in place.

To Take Up Wear.

If the spindle becomes loose in its bearing a slight turn of the adjusting nut L (which has left hand thread) and jamb nut M will take up all wear.

To Attach Handpiece to Any Cable Engine.

Unscrew the swivel on end of Handpiece which exposes the coupling, unscrew the latter from spindle, and solder cable in end with the two flats milled on.

Screw coupling back in place again tightly, to avoid unscrewing when running backward, attach swivel to flexible sheath and screw back in place.

Handpiece Repairs.

We would draw your special attention to the extra facilities which we possess for the efficient and prompt repairing of Handpieces. We have a staff of skillful workmen constantly engaged on this class of work, and Handpieces entrusted to us for repair will receive careful attention.

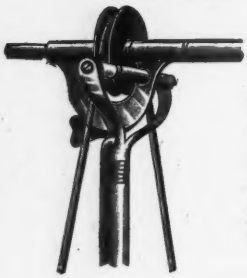
Patented Feb. 5, '95.

THE DENTAL PROTECTIVE SUPPLY CO.

CHICAGO, ILL.

"No. 1" Engine

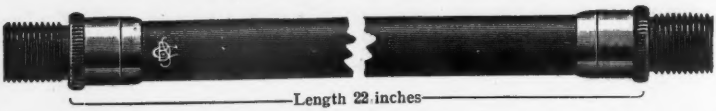
PRICES OF SEPARATE PARTS.



ENGINE PULLEY HEAD.

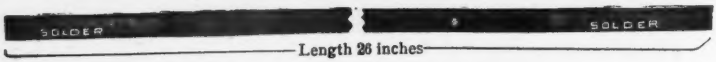
This cut of the enlarged details of the Pulley Head of our No. 1 Dental Engine, shows the thumb piece by which the arm can be lowered. It will be seen that the pulley wheel is *centred* on long bearings, thereby insuring steady running. This Pulley Head is made to fit the standards of the leading Dental Engines.

ENGINE SHEATH.



Length 22 inches

ENGINE CABLE.



Length 26 inches

FLEXIBLE SPRING CONNECTION.

DRIVING SPRING.

PRICES.

Engine Base and Standard	$18.00
Pulley Head complete	$ 8.00
Sheath with nickel plated ferrules, complete	$ 1.50
Cable	$ 1.50
Flexible Spring Connection, complete	$ 2.25
Flexible Driving Spring	$ .10
Engine Driving Cord	$ .10
Water Cup	$ 1.50

OUR No. 1 DENTAL ENGINE.

MODERN DESIGN.
BEST WORKMANSHIP.

Students requiring the best value for their money will recognize the efforts we are making to supply their wants by furnishing a modern Dental Engine at a moderate cost.

This Cable Arm Engine supplied with our No. 1 Handpiece is constructed upon correct mechanical principles, and is the easiest running Dental Engine made.

The Drop Pulley Head is supplied with long bearings, insuring steady running. The Hub, as will be seen in the cut, is chambered so as to *center* weight of wheel.

To raise the arm it is only necessary to give a slight upward toss to the hand-piece. To lower it requires a slight pressure on the thumb-piece at A.

Each Engine is supplied with a Flexible Sleeve and Water Cup.

Diameter of Driving Wheel, 12 inches.
Weight of Driving Wheel, 13 pounds.

Price with 14 Instruments and Oiler

$38

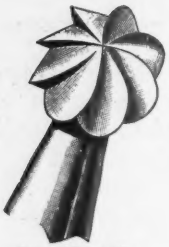
Boxing 75 cents extra.

DENTAL PROTECTIVE SUPPLY CO.,

CHICAGO, ILLS.

The "Dual-Blade" Bur

(SELF-CLEANSING.)



Patented Feb. 5, '95.

Patented Feb. 5, '95.

EXAMINE THE BLADES!

These twin blades entirely traverse the cutting surface of the Bur. The blades are stone-cut and brought to a fine keen edge. These Burs will be found to clear themselves thoroughly when in use, enabling the operator to rapidly cut—not *grind*—Dentine, and prepare cavities with the least possible pain to the patient. This is what we make Burs for—**ADAPTABILITY TO CUT SENSITIVE DENTINE**—and that's what they are used for! We wont enlarge upon their capabilities for drilling steel or glass, though they will do so, but for cutting sensitive Dentine with the minimum of pain to the patient, our "Dual-Blade" Burs have no equal.

WHEN ORDERING PLEASE STATE THE STYLE REQUIRED.

For Nos 1 and 3. Right Angle Attachments.

For Universal Hand-Pieces.

For No. 2. Right Angle Attachment.

Kept in Stock in the following shapes and sizes:

ROUND.
WHEEL.
CONE.
INVERTED CONE.
PEAR.
BUD.
POINTED FISSURE.
SQUARE FISSURE.
OVAL.

UNIVERSAL AND RIGHT ANGLE BURS.

Sizes 0 to 7 Inclusive, $2.00 Per Doz.

Sizes 8 to 11 Inclusive (Universal Burs Only) ..... $2.75 Per Doz.

QUANTITY PRICES.

Burs—Universal and Right Angle (doz. price, $2.00).... per half gross..$10.50
" " " " " (doz. price, $2.75) ...." " " .. 14.50

Send for sample dozen and enclose $2.00.

THE DENTAL PROTECTIVE SUPPLY CO.
CHICAGO, - - ILLINOIS.

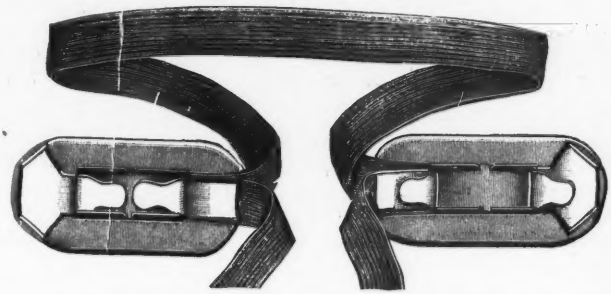
DENTAL FLOSS SILK.

WAXED OR PLAIN.

PRICES.

		Per Dozen.	Per Spool.
PLAIN.....	12 yards spools,	$ .75	$ .08
	24 yards spools,	1.35	.15
WAXED, in boxes, as per cut.	12 yards spools,	1.25	.12
	24 yards spools,	2.00	.20

EUREKA RUBBER DAM HOLDER.



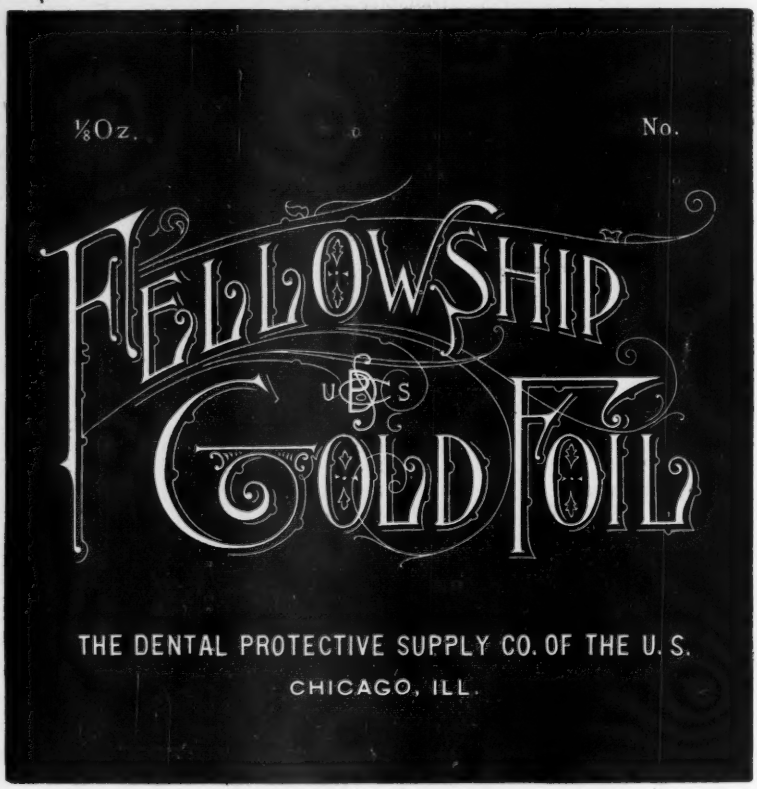
The "Eureka" is the only Holder made in which the elastic ribbon is nicely adjusted to both clamps without sewing, and can be lengthened or shortened by a very simple movement of levers and pressure plates, always holding the ribbon flat and smooth.

PRICE, NICKEL PLATED $1.00

DENTAL PROTECTIVE SUPPLY CO.

☞CASH MUST ACCOMPANY ALL ORDERS.

FELLOWSHIP GOLD FOIL.



Soft Semi-Cohesive and **Extra Cohesive Foil,**
Nos. 3, 4, 5, 6, 10, 20, 30, 40, 60.

Corrugated Foil, Soft and Semi-Cohesive, in above numbers.

Rolled Gold Foil, Extra Cohesive, FROM NO. 20 UPWARD.

Price, per	⅛ oz.	$ 4 00	
" "	½ oz.	15 00	
" "	oz.	29 00	per oz.
"	2 ozs. at one time	28 00	" "
"	5 ozs. " " "	27 50	" "

DENTAL PROTECTIVE SUPPLY CO.
CHICAGO, - - - - - ILLINOIS.

☞ CASH MUST ACCOMPANY ALL ORDERS.

Fellowship Gold Cylinders

Plain.....—Nos.	8	7	6	5	4	3	2	1	0
Corrugated—Nos.	½	¾	1	2	3	4	5		

FELLOWSHIP:

PLAIN CYLINDERS, SOFT AND COHESIVE.
CORRUGATED CYLINDERS, SOFT AND COHESIVE.

Price, per ⅛ oz	$ 4.00
" " ¼ oz	15.00
" " oz	29.00
" 2 ozs. at one time	per oz. 28.00
" 5 ozs. " "	" 27.50

Each box of Plain Cylinders is labeled, showing the proportion of a sheet of Foil contained in each Cylinder as follows:

SMALL.

In No. 8, 40 Cylinders,=1 Sheet of No. 4 Foil.
" " 7, 30 " = " " " "
" " 6, 20 " = " " " "

MEDIUM.

In No. 5, 12 Cylinders,=1 Sheet of No. 4 Foil.
" " 4, 8 " = " " " "
" " 3, 4 " = " " " "

LARGE.

In No. 2, each Cylinder contains ½ Sheet of No. 4 Foil.
" " 1, " " " ¾ " " "
" " 0, " " " 1 " " "

The Dental Protective Supply Co.

CHICAGO, - - - - - - - ILLINOIS.

"No. 1" ALLOY.

Put up in Shavings, and Medium and Fine Filings.

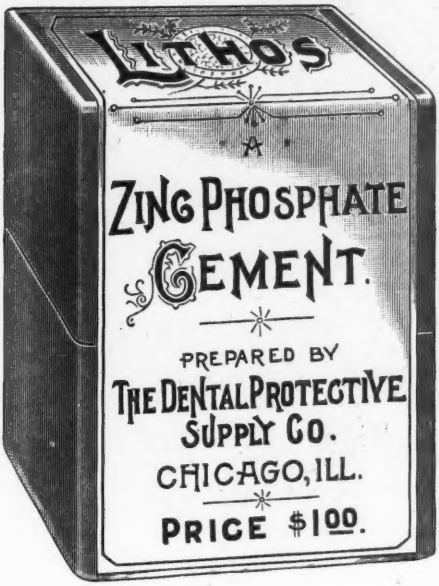
This alloy is made by a special process which ensures uniformity, and is the result of a series of scientific experiments.

It sets quite quickly, and should be placed in the cavity under even pressure, using spunk or bibulous paper between the alloy and the instrument.

We have never yet found an Alloy its equal for hardness, strength of edge, and entire absence of shrinkage.

PRICE, PER OZ. TROY, $2.50.

PRICE, PER 2 OZS., $4.50; 5 OZS., $10.00.



COLOR -YELLOW.

Is non-conducting.

Non-irritating to the pulp.

It neither shrinks nor expands.

Gives no pain whatever to sensitive dentine.

Is thoroughly compatible with tooth-structure.

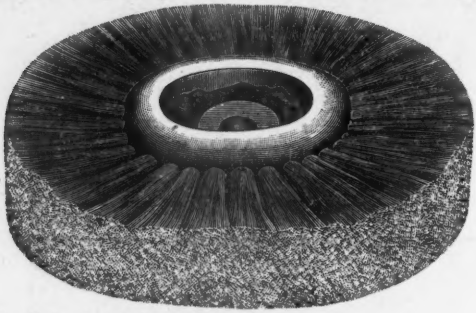
Possesses the desirable quality of easy mixing.

Retains plasticity sufficiently long for proper manipulation

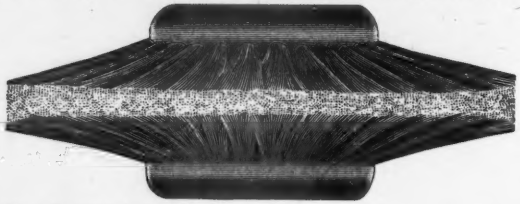
FOR the attachment of crowns, gold caps and inlays, this Cement gives excellent results. It has a durability equal to the best cements on the market.

Price $1.00

BRUSH WHEELS.



No. 26. Soft, size 2¾ in., price..... 34



No. 27. Converging, stiff, 3 in., price..... .44

No. 1. Tooth Brush Wheel,
Bone center, price .20

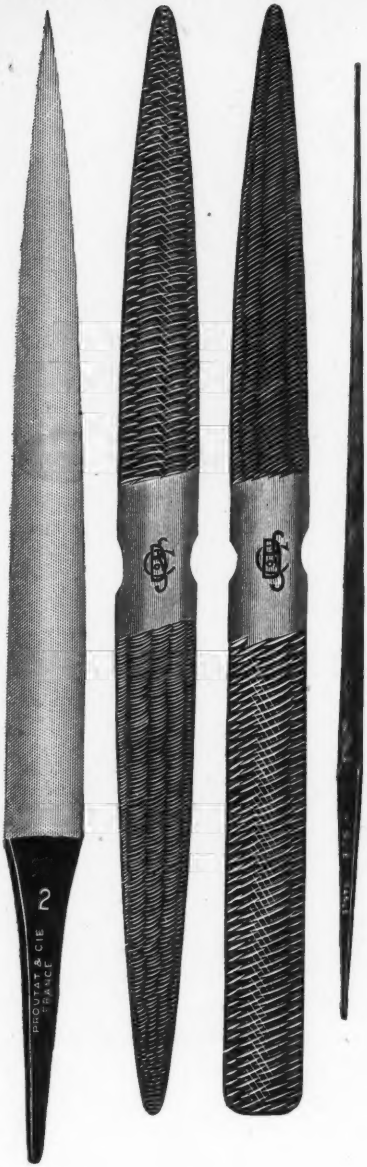
Tooth Polishing Brush,
Per doz. .30. Each .03.

No. 2 Tooth Brush Wheel,
Straight, bone center, price .25

Steel Wire Bur Brush,
Size 1⅛ dia. Price .50

The above cuts represent samples of the Brushes we keep in stock—various other sizes can be supplied on application.

DENTAL PROTECTIVE SUPPLY CO.
CHICAGO, ILL.



FILES

FOR

PLATE AND VULCANITE

WORK.

Half round Tang 4½in., each .25
" " " 5 " " .30
" " " 6 " " .35
" grobet " 4½" " .25
" " " 5 " " .30

D'ble End, h'f round, 7½in, each .25
" " " 8 " " .30

Double End Oval, 7½in., each .35

Rat tail.....5 in., each .20
" .....6 " " .23

Flexible Separating Files,
All sizes.....per doz. $1.25

Flexible Plug-Finishing Files,
Price,.....per doz. $2.00

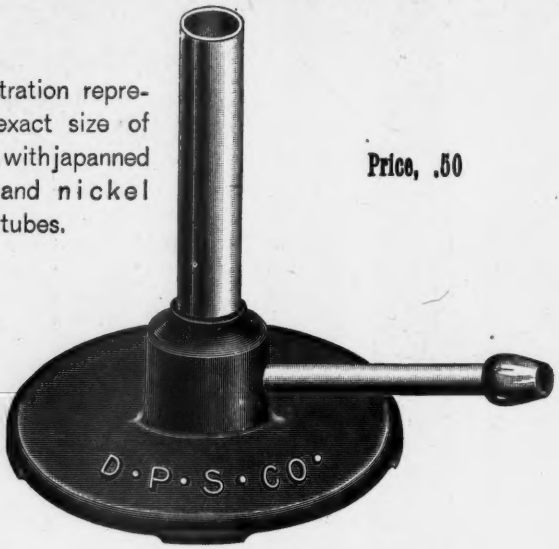
The Dental Protective Supply Co.,

CHICAGO, ILLINOIS.

BUNSEN BURNER.

Illustration represents exact size of burner, with japanned stand and nickel plated tubes.

Price, .50



"No. 1" ARTICULATOR.

Made Substantially of Brass and well finished in all parts.
Price Nickel Dipped, .90

TO THE PUBLISHERS OF

The Dental Digest.

2231 Prairie Avenue, CHICAGO, ILLS.

Please forward the DENTAL DIGEST to me monthly for the year 1896, for which find enclosed $2.00.

Name.....

Street No.....

City.....

County.....

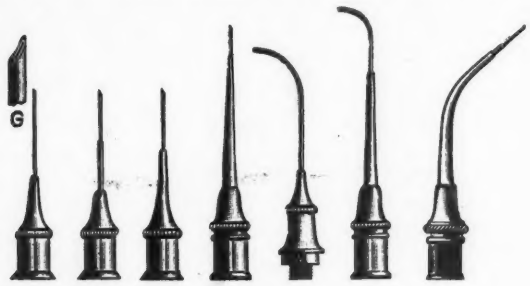
State.....

Yearly subscription $2.00 (payable in advance) in United States, Canada and Mexico.

Gt. Britain, Germany and France $3.00 per annum.

Fill out this page carefully, detach it, enclose your subscription money, and forward same to above address.

HYPODERMIC NEEDLES.



FULL SIZE.

	Each.
A.—Plain Seamless Steel Needle, Nickel Plated	25 cts.
B.—Reinforced Steel Needle, Nickel Plated	35 "
C.—Obtunding Reinforced Needles, with improved reinforced hub, made of one piece, thus avoiding all possibility of leakage	35 "
D.—Craft's Needle, with a tapering tube, blunt pointed Steel Needle, easily kept clean	50 "
E.—Solid Seamless Gold Abscess Needle, straight or curved	90 "
F.—Solid Seamless Gold Lewis Abscess Needle, straight or curved	80 "
G.—Illustrates **blunt point** on all our Dental Hypodermic Needles (not abscess).	
H. -Curved Steel Dental Hypodermic Needle, with any size needle, coarse, medium, or fine	50 "

THESE Needles should not be mistaken for the cheap variety of unreliable needles on the market, but are first-class in every respect, the steel Needle being made of finest SEAMLESS tube, highly tempered, and with very fine concave points (see Fig. G.) Our needles are noted for their fine elasticity, durability, and strength.

SIZES OF HYPODERMIC STEEL NEEDLES.

No. 16	corresponds	with	No. 23	Brown	& Sharps	gauge,	medium.
No. 17	"	"	No. 25	"	"	"	fine.
No. 18	"	"	No. 26	"	"	"	very fine.

Dental Protective Supply Co.,

CHICAGO, ILLS.

GOULD DENTAL CHAIR.

Fig. II—Normal.

We would merely call your attention to a few of its Advantages over all other Dental Chairs:—

1st. The Gould is the only first class low priced chair.
2nd. The Gould is the only low priced pedal lever chair.
3rd. The Gould has more and better movements than any high priced chair made.
4th. The Gould is the only chair that has the Horizontal Anæsthetic Position.
5th. The Gould is the only chair that has the Chloroform Narcosis Position.
6th. The Gould is the only complete chair, requiring "no extras."
7th. The Gould obtains all the positions secured by other chairs and more.
8th. The Gould chair has the most satisfactory head rest made.
9th. The Gould is the only chair made that gives you the side tilt without "extra cost."
10th. The Gould is the simplest and therefore the easiest to keep in order.
11th. The Gould is the only chair with which an Elegant Nickel Spittoon is furnished Free.
12th. The Gould is the only chair that can be tilted forward for taking impressions.
13th. The Gould is more convenient to the operator than any other.
14th. The Gould gives satisfaction when others fail.
15th. The Gould is the *best* and *cheapest* chair in the world.
16th. The Gould is sold on its merits and is warranted to be as represented.

Fig. XIV—Chloroform Narcosis.

CANTON SURGICAL AND DENTAL CHAIR CO.,

38 to 54 E. Eighth and 50 to 54 S. Walnut Sts, CANTON, OHIO.

Sole Manufacturers Gould Dental, Gould Motor Dental and "Yale" Surgical Chairs, Electric Dental Engines and Brackets, Fletcher Fountain Spittoons, Foot Power and Electric Cord and Cable Dental Engines, etc., etc.

"THE BEST STRIP MADE."

Dr. Howard's Dental Finishing Cloth Strips.

Made in four grits—Coarse, Medium Coarse, Medium, Fine, and in three widths Broad, Medium, Narrow. Put up mixed or separate, as desired, in boxes containing an amount equal to one gross, of medium width, seven inches long. Send for them if your dealer does not keep them. Manufactured only by

CHAS. T. HOWARD, - - - - ROCHESTER, N. Y.

REPAIR WORK.

We have a staff of skilled workmen in our Chicago factory engaged on repairs and are prepared to guarantee first-class work.

☞ **All repair work must be accompanied by Cash to avoid detention**

Cavity Burs, recut and stoned	$ .60	per doz.
Finishing " " "	1.20	"
Excavators, repointed	.75 to $1.00	"
Pluggers, reserrated	1.50	"
" Re-serrating, Varney's or other fine-cut pluggers	3.00	"
Nickel Plating Forceps	each .50	

Should your handpiece be out of order send it to us, for probably it can be repaired; if so, we have special facilities for such work.

DENTAL PROTECTIVE SUPPLY CO.

Chicago Ill.

THE

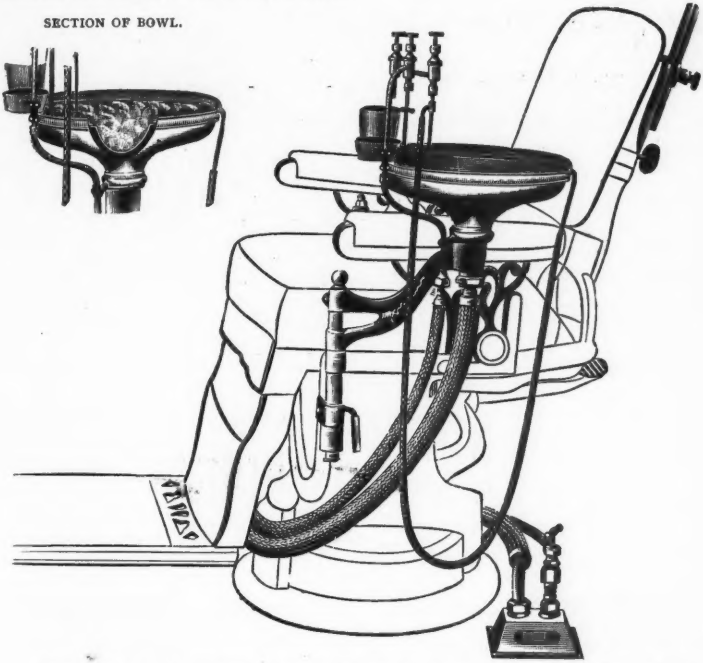
Clark Fountain Spittoon

A SELF-CLEANSING Spittoon is the only one that suits the requirements of a modern Dental office.

We can justly claim that this spittoon is way ahead of any on the market. It is supplied with TWO BOWLS, the inner bowl REVOLVING by a slight flow of water and CLEANSING the bowl AUTOMATICALLY. There is nothing in the centre of the bowl to obstruct the way.

Overflow is impossible, ALL SURPLUS WATER ESCAPING between the inner and outer bowls.

SECTION OF BOWL.



Complete with nickel plated Glass Holders, Saliva Ejector, Chair Bracket, Spittoon Bracket, Silk Covered Tubing and Floor Connections.

PRICE $60.00.

☞ STATE NAME OF YOUR CHAIR WHEN ORDERING.

The Dental Protective Supply Co.,

1101 CHAMPLAIN BLDG., CITY.

DENTAL RUBBER.

We can confidently recommend our Dental Rubbers to the profession, the finest gum only is selected, allowing thin but strong plates, entire absence of porosity enabling a high polish to be given.

Black Rubber	per lb.	$2.25
Light Red Rubber	"	2.75
" " " in 5 lb. lots	"	2.50
" " " " 10 lb. "	"	2.25
Dark Red "	"	2.75
" " " " 5 lb. "	"	2.50
" " " " 10 lb. "	"	2.25
Rose Pink No. 3 (*Imported*)	"	5.00
" " No. 4 "	"	6.00

RUBBER DAM.

We carry a high class Rubber Dam put up in rolls 15 ft. long by 7 in. wide.

Smooth or Corrugated, per roll $1.25.

Dental Protective Supply Co.,

1101 Champlain Bldg., CHICAGO.

TEETH

WE have now opened our City Depot with a good selection of TEETH made in Chicago from the English formula.

FOR TRANSLUCENCY, BONY TEXTURE, LIFE LIKE APPEARANCE, and DELICATE BLENDING of SHADES these Teeth have NO EQUAL in any manufactured in this country

OUR teeth are by all odds the STRONGEST in the market, and are all supplied with LONG PINS.

THEY take a BEAUTIFUL POLISH owing to an entire ABSENCE OF POROSITY, combined with the fact that the COLORING IS CARRIED COMPLETELY THROUGH the teeth.

PRICES.

	EACH.	$10 LOTS.	$25 LOTS.	$50 LOTS.	$100 LOTS.	$300 LOTS.
Plain Plate, **LONG PINS.**	12½	12	11½	11	10	*9
Plain Rubber,	12	11½	11	10	9	*8

***$300 Rate Spot Cash.**

☞ **WE SHALL ANNOUNCE OUR GUM TEETH AND PINLESS TEETH IN A SUBSEQUENT ISSUE.**

DENTAL PROTECTIVE SUPPLY CO.

1101-1103 Champlain Bldg.

CHICAGO.

Chicago College of Dental Surgery.

DENTAL DEPARTMENT OF LAKE FOREST UNIVERSITY.

The Annual Winter Course of Instruction will begin about October 1st, 1895, and end about April 1st, 1896.

Three full winter courses of lectures are required before graduation. Graduates of reputable pharmaceutical and undergraduates of medical colleges are admitted to the second year course, and can become candidates for graduation after taking two winter courses of lectures.

GRADUATION IN MEDICINE.

Graduates of the Chicago College of Dental Surgery will be admitted to the medical colleges, and may become candidates for graduation in medicine after attending two full courses of lectures.

Graduates of the Chicago College of Dental Surgery are excused from the lectures on anatomy, physiology and chemistry, from chemical and histological laboratory work and dissecting.

Students desiring to graduate in medicine are required to notify the Dean in writing of their intention at the beginning of their second course.

TOPICAL STATEMENT OF WORK

FIRST YEAR.

During the Freshman Year, the studies taken up are Theoretical and Practical Chemistry and Anatomy, Histology, Operative and Prosthetic Technics and Operative and Prosthetic Dentistry and Physiology, and during the latter part of the term some practical work in the Infirmary.

SECOND YEAR.

In the Junior Year the studies of the Freshman Year are reviewed and the student performs practical work in the Laboratories and operates in the Infirmary.

THIRD YEAR.

During the third year the student listens to lectures on Oral Surgery, Materia Medica and Therapeutics, Pathology, Operative Dentistry, Dental Anatomy and Pathology and Orthodontia. In addition to the lectures each student is expected to operate in the Infirmary and perform practical work in the Laboratory.

Matriculation Fee, good to the close of the term.....$ 5.00
General Ticket.....100.00

There will be no separate fees for Chemical and Histological Laboratory work, dissecting and final examinations as heretofore.

FEES FOR THE ANNUAL SPRING AND SUMMER COURSE.

Matriculation Fee, good till the following April .....$ 5.00
Tickets for the Course 20.00

This amount will be deducted from the fees of the next following winter session.

Instruments and appliances for clinical department will cost from $25 to $40.

Board, including light and fuel, can be obtained at a convenient distance from the college at from $4 to $6 a week.

Graduates of the College are requested to notify the Dean of changes in their residences.

---

*A fee of $5 must be deposited to cover chemicals and breakage in the Chemical Laboratory.

Letters of Inquiry should be addressed to

DR. TRUMAN W. BROPHY, Dean,
126 State Street, Chicago, Ill.

....THE COLLEGE BUILDING....

Southeast Corner Wood and Harrison Sts.

The new college building occupies a prominent position among a group of fourteen others, comprising medical colleges, hospitals and schools.

The lot on which the building stands has a frontage of eighty-five feet, and a depth of one hundred and twenty feet. It is a five story and basement structure, the basement and first story being of rock-faced Bedford stone, and the superstructure of pressed brick and terra-cotta, with terra-cotta trimmings.

The building has two entrances, the main one through a large cut-stone doorway surmounted by a stone arch beautifully ornamented with carved work. The interior is finished in hard wood, according to the latest idea of elegance, convenience and comfort.

The entire six floors of the building are divided into lecture rooms, class rooms, clinic rooms, etc., with the exception of the second floor, which is devoted to the Dental Infirmary. The chief lecture room has a seating capacity for four hundred and fifty students. There is also a dissecting room, thoroughly equipped with all the requisites for the study of human anatomy.

There are Histological, Chemical, Bacteriological Laboratories; also Laboratories for the study of Operative and Prosthetic Technics, and one for the construction of artificial dentures.

The building occupied by the Chicago College of Dental Surgery is, in all its appointments, one of the most perfect and complete of its kind.

Letters of inquiry should be addressed to

Dr. TRUMAN W. BROPHY, Dean,
126 State St., CHICAGO, ILL.

ESTABLISHED 1845.

Ohio College of Dental Surgery.

DEPARTMENT OF DENTISTRY,
UNIVERSITY OF CINCINNATI.

N. W. Cor. Court and Central Ave.

FIFTIETH ANNUAL SESSION BEGINS
OCTOBER 9, 1895,
AND CONTINUES SIX MONTHS.

For information or announcement, address

H. A. SMITH, D. D. S.,
Dean.

or

H. T. SMITH, D. D. S.,
Secretary,
128 Garfield Place.

Northwestern University Dental School

CHICAGO, ILL.

Session of 1895 and 1896 begins the 1st day of October. The clinic of this school is very large, offering the best opportunity to fit students for practical operations. For catalogue and other information, address

EDGAR D. SWAIN, D. D. S., Dean.
EDMUND NOYES, D. D. S., Sec'y.

65 RANDOLPH STREET.

Pennsylvania College of Dental Surgery.

Eleventh St., below Spruce, corner of Clinton.

FORTIETH ANNUAL SESSION, 1895-96.

FACULTY AND AUXILIARY INSTRUCTORS.

J. EWING MEARS, A. M., M. D., Professor of Anatomy and Surgery.
C. N. PEIRCE, D. D. S., Professor of Dental Physiology, Dental Pathology, and Operative Dentistry.
WILBUR F. LITCH, M. D., D. D. S., Professor of Prosthetic Dentistry, Materia Medica and Therapeutics.
HENRY LEFFMANN, M. D., D. D. S., Professor of Chemistry and Metallurgy.
ALBERT P. BRUBAKER, M. D., D. D. S., Professor of Physiology and General Pathology.

PERCIVAL E. LODER, M. D., D. D. S., Demonstrator of Anatomy.
GEO. W. WARREN, D. D. S., Chief of the Clinics and Demonstrator of Operative Dentistry.
I. NORMAN BROOMELL, D. D. S., Demonstrator of Prosthetic Dentistry.
EDWARD F. WAYNE, D. D. S., Demonstrator of Chemistry.
FREDERICK R. BRUNET, D. D. S., Demonstrator of Prosthetic Dentistry.
RUPERT BEALE, D. D. S., Demonstrator of Prosthetic Dentistry.
WILLIAM B. WARREN, D. D. S., Demonstrator of Operative Dentistry.
A. W. DEAN, D. D. S., Demonstrator of Prosthetic Dentistry.
R. WALTER STARR, D. D. S., Instructor in Crown and Bridge Work.
W. K. THORPE, D. D. S., Demonstrator of Operative Dentistry.
GEO. M. WEIRICH, D. D. S., Demonstrator of Operative Dentistry.
MARTHA ALLAIRE TERRY, D. D. S., Demonstrator of Operative Dentistry.
LUTHER G. TERRY, D. D. S., Demonstrator of Operative Dentistry.
E. ROLAND HEARN, D. D. S., Demonstrator of Operative Dentistry.
F. A. CONEY, D. D. S., Instructor in Carving Block Teeth and Porcelain Dentures.
E. A. KRETSCHMAN, Instructor in Modelling.

CLINICAL INSTRUCTORS.

Dr. J. N. FARRAR.	Dr. C. S. STOCKTON.	Dr. C. E. FRANCIS.
Dr. W. G. A. BONWILL.	Dr. T. F. CHUPEIN.	Dr. E. C. BAXTER.
Dr. A. L. NORTHRUP.	Dr. W. H. TRUEMAN.	Dr. A. H. BROCKWAY.
Dr. C. PALMER.	Dr. J. HAYHURST.	Dr. A. B. ABELL.
Dr. R. H. SHOEMAKER.	Dr. J. G. TEMPLETON.	Dr. R. HOLLENBACH.
Dr. CHAS. F. BONSALL.	Dr. W. R. MILLARD.	Dr. R. W. STARR.

This College has accepted the requirements of the National Association of Dental Faculties with regard to admission and graduation of students. (See announcement for 1895-96, which can be procured from the Dean.)

THE SPRING AND FALL SESSIONS.

THE SPRING COURSE commences on the second Monday in March and continues until June 20th. Fee, $50, which will be credited upon the fee for the regular session.

THE FALL COURSE will commence on September 4, and continue until the first of October, and will be free to those who matriculate for the regular session.

Attendance upon the Spring and Fall Courses will be deemed equivalent to the term of pupilage under a private preceptor.

THE REGULAR SESSION

Will commence on October 1, 1895, and continue until the 2d of April ensuing. Twenty lectures will be delivered each week on the various branches taught.

CLINICAL PRACTICE.

Lecture hours excepted, general clinical practice is available for the student continuously through the day. Competent instructors are always present.

GRADUATION IN MEDICINE.

By an arrangement with Jefferson Medical College, such students as may desire to do so, can, if found qualified, obtain the two degrees, in Dentistry and Medicine, in five years. Students desiring to graduate in medicine are required to notify the Dean of their intention at the beginning of their second course.

FEES.

Matriculation (paid but once)	$ 5 00
For each year (Demonstrator's Ticket included)	100 00
Dissecting Fee	10 00
Diploma Fee	30 00

Board can be obtained at from $4 to $6 per week.

The Instruments and Tools required can be procured for from $35 to $45. This sum does not include the price of Dental engine.

For further information, address

C. N. PEIRCE, D. D. S., Dean, 1415 Walnut St., Philadelphia.

New York College of Dentistry

205-7 East Twenty-third Street,

NEW YORK, - - - U. S. A.

The attention of students is respectfully called to the following announcement by the N. Y. C. D.

1 *A yearly advance in the preliminary education requirements of students entering the College.*

2 *A yearly lengthening of the lecture session—that of 1894-95 to six months, that of 1895-96 to seven months, and that of 1896-97 to eight months.*

3 *The requirement of evidence, prior to graduation, of three years' actual study and practice of dental surgery, inclusive of attendance on three lecture sessions in separate years.*

4 *The inauguration, during the lecture session of 1894-95, of graded courses of practical work in subclasses, for the first year class, the second year class, and the third year class, respectively.*

c All students taking their first matriculation from October 21, 1894, to October 20, 1895, inclusive, thereby becoming candidates for degrees in the class graduating in 1898, must file a 12-academic-count or higher regents' certificate within one year after said matriculation.

d All students taking their first matriculation from October 21, 1895, to October 20, 1896, inclusive, thereby becoming candidates for degrees in the class graduating in 1899, must file a 24-academic-count or higher regents' certificate within one year after said matriculation.

e All students taking their first matriculation from October 21, 1896, to October 20, 1897, inclusive, thereby becoming candidates for degrees in the class graduating in 1900, must file a 48-academic-count or higher regents' certificate within one year after said matriculation.

f All students taking their first matriculation after October 21, 1897, must file a 48-academic-count or higher regents' certificate at the time of said matriculation.

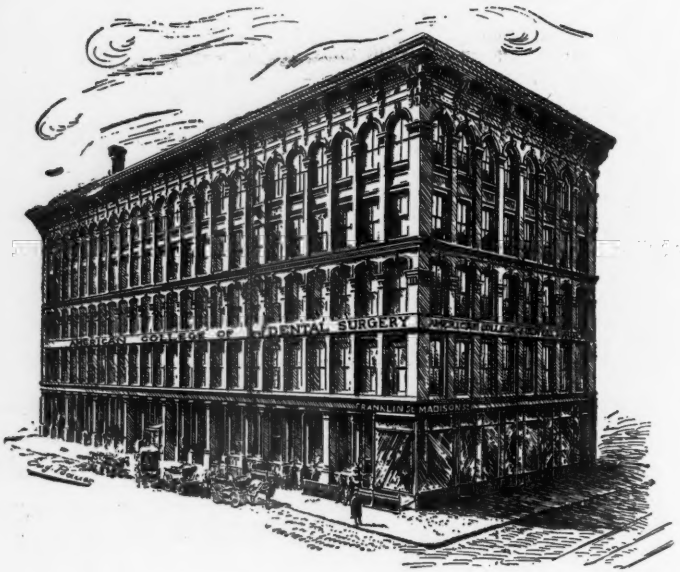
For further particulars, or the College Catalogue, address

FRANK ABBOTT, M. D., Dean,

22 West Fortieth St., New York

American College of Dental Surgery,

Cor. Madison & Franklin Sts., Chicago, Ill.



Fall and Winter Sessions of Lectures and Clinics, with Infirmary Practice,

OCTOBER TO APRIL.

Post-graduate Courses open from April to October

For catalogues and circulars address

THEO. MENGES, D. D. S.,

Cor Madison & Franklin Sts., Chicago, Ill.

Vol. I. DECEMBER, 1895. No. 12.

The Dental Digest

A MONTHLY SUMMARY OF DENTAL SCIENCE DEVOTED TO THE PROGRESS OF DENTISTRY.

THE OFFICIAL ORGAN OF THE

Dental Protective Association of the United States.

PUBLISHED BY
J. N. CROUSE, D. D. S.,
CHICAGO, ILLINOIS.

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☞ **We cannot undertake to supply back numbers of the Dental Digest after next month.**

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